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Plant Genetics and Germplasm Institute
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Beltsville, Maryland

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THE POTATO-BREEDING PROGRAM, USDA, 1976,

by
Raymon E. Webb, and Others
and
State Cooperators

(Forty-seventh Annual Report by Cooperators)
Agricultural Research Center
Beltsville, Maryland

June 1977

This progress report includes tentative results of research not sufficiently complete to justify general release. Such findings, when adequately confirmed, will be released promptly through established channels. Therefore, this report is not intended for publication and should not be referred to in literature citations.

PGGI 77/6

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BELTSVILLE AGRICULTURAL RESEARCH CENTER (BARC) BELTSVILLE, MARYLAND
AND CHAPMAN AND AROOSTOOK FARMS, PRESQUE ISLE, MAINE

Raymon E. Webb (BARC), David R. Wilson (Presque Isle, Maine)
and James A. Frank (Orono, Maine)

BARC

Breeding and Evaluation: Two hundred and eight parental clones and varieties possessing improved quality, pest resistance and adaptability characteristics were included in breeding blocks. Six hundred eighty-eight seed lines from selective matings were obtained. One hundred and eighty seed lines were selected for seedling tuber production in the greenhouse. Approximately 101,000 seedling tubers were produced for distribution to cooperators. Approximately two hundred clones were evaluated for resistance to viruses A, X and Y.

Distribution of Materials: Distribution of true seed, seedling tubers, advanced selections and varieties to domestic and foreign cooperators are given in Tables 1, 2 and 3.

PRESQUE ISLE

Although initial plantings were made May 17 and 18, frequent, heavy rains delayed further planting until May 27. Then, intermittent rainfall delayed completion of planting until June 16. Frequent rains continued through the growing season and well into the harvest (Table 4). Vine kill, except on yield trials, was done within two to three days of mid-August. Harvest began in late August and was completed in early October. Much of the materials planted for selection, increase and maintenance had only a 65-75 day growing period in 1976.

CHAPMAN FARM

Approximately 50,000 seedling representing parental combinations from BARC were planted on Chapman Farm for selection purposes. Approximately 1,650 12-hill plots were grown from the 1975 seedling tuber planting. Four hundred and seventy-five 40-hill plots were grown from the 1975 12-hill selections for further selection and evaluation. Three clones (B6987-29, B7147-8 and B7583-6) were increased for grower trials as well as to furnish a seed source from which additional foundation seed could be produced. Clones furnished cooperators from Chapman Farm are given in Tables 2 and 3.

AROOSTOOK FARM

Currently grown potato varieties (40) and a collection of older American varieties (101) were grown either for research purposes or seed maintenance and distribution. Approximately 150 breeding lines possessing specific genetic characteristics were grown for distribution and use in breeding. All

yield and disease evaluation trials (see report by James Frank, et. al. pp were grown on either Aroostook or the adjacent Peter's Farm.

Experimental design for all yield trials was a randomized block with four replication. All round white tuber trials received 150 pounds of NPK per acre and the russet types received 180 pounds of NPK banded with a 2-row planter. Clones were hand planted in 25-hill plots with 9 inches between seedpieces. Cultural methods and materials for weed, insect, and disease control were according to local recommendations. Rainfall and temperature during the season are given in Table 4. At harvest, all entries were graded and samples had selected for specific gravity and quality evaluations. Specific gravity was determined by the air and water method. After specific gravities were determined, the samples were divided and placed in 50°F and 40°F storage at 90 percent relative humidity.

Samples were fried after 4 months of storage. One set of samples was fried directly from 50°F storage. Because of the poor chip color of most of the entries from 50°F storage, only those entries shown in Table 15 were reconditioned from 40°F to 70°F for 3 weeks prior to frying.

Potato chips were made from each sample by cutting the tubers in half and taking a 1/16-inch thick slice from each tuber with a rotary food slicer. Slices were rinsed in water and placed on paper towels to remove excess water. Chips were then fried at 340°F in Primex vegetable shortening until bubbling ceased.

A french fry plug 3/8-inch in diameter was cut from each half of the tubers in the sample. After plugs were trimmed, rinsed, and excess water removed, they were fried at 365°F in Primex shortening for 5 minutes.

Each potato chip and french fry was classified after frying into color classes. Chip classes ranged from 1 = very light to 10 = very dark. French fry classes ranged from 1 = very light to 5 = very dark. Weighted averaged were calculated by multiplying the number of chips or fries in each color class by the color class, totaled, and divided by the number of chips or french fries in each sample. Color ratings were made using the PCII reference color chart 1206-U.

After color classification, each french fry plug was broken open and internal texture classified as 1 = mealy, 2 = intermediate, or 3 = soggy and a weighted texture index calculated.

SUMMARY

The clone B6987-56 was released as the variety Atlantic and foundation seed made available to most Midwestern and Northeastern State Seed Certification agencies as well as a number of growers of foundation and certified seed. Performance of B6987-29 (round white), B7147-8 (russet) and B7583-6 (russet) in yield trials and commercial quality evaluations indicate these clones should be elevated to varietal status in 1977. B6987-29 will be named the

variety Belchip. Varietal names for B7147-8 and B7583-6 are still under consideration.

Performance data on clones B6503-2 and B6969-2 indicate they are worthy of extensive grower trials in 1977.

Table 1. Distribution of first year seedling tubers and true seed of selected parental combinations from BARC, Beltsville, Md.

Location	Cooperator	Number		
		Progeny	Seedling Tubers	True Seed
<u>Domestic</u>				
Colorado	James Twomey		10,340	
Idaho	Joseph Pavek	72	6,653	
Maine	David Wilson	205	53,613	
Minnesota	Florian Lauer	54	5,921	
North Carolina	Frank Haynes	14		6,300
		TOTAL	76,527	6,300
<u>Foreign</u>				
Pakistan	Said Kamal Khan	73	10,047	
	Altaf Hussain			
	Sadiq Achakazi	59	9,982	
		GRAND TOTAL	96,556	6,300

Table 2. Distribution of Varieties and Advanced Selections sent to Cooperating States.

State	Cooperator	Number	
		Varieties	Clones
Alabama	J. L. Turner	1	15
Florida	James Shumaker	14	197
Kansas	Rolf Borchet	127	
	J. K. Greig	1	
California	Ron Voss		2
Maine	J. Frank	3	7
	S. S. Leach	10	52
Maryland	Lind Sanford		70
	R. Rebois		7
	R. Goth	17	
	S. Sinden	46	171
Mississippi	C. P. Hegwood	2	9
New Jersey	M. Henninger	5	149
New York	R. Cetas		17
	D. Thurston		2
	L. Weber	2	9
North Carolina	F. Haynes	4	
Ohio	F. Lower		1
Pennsylvania	D. MacKenzie	1	31
South Carolina	D. Ezell	1	5
Virginia	B. Graves	21	175
TOTAL		253	917

Table 3. Varieties and Clones sent to foreign countries.

Country	Cooperator	<u>Number</u>	
		Varieties	Clones
Bulgaria	H. Hyland	12	
Nepal	S. K. Shrestha	1	1
Pakistan	Said Kamal Khan	3	4
	Altaf Hussain		
	M. Sadiq Achakazi	3	4
	Hamid Razvi		
South Africa	F. J. du Ploy	14	
USSR	H. Hyland	5	
TOTAL		38	9

Table 4. Weather data, Aroostook Farm, Presque Isle, Maine; April - September 1976.

Date	Temperature 7-day Average F		Precipitation 7-day Total
	Maximum	Minimum	inches
4/1-4/7	41	29	1.23
4/8-4/14	40	20	.03
4/15-4/21	59	34	.11
4/22-4/28	49	32	.91
4/29-5/5	59	35	.46
5/6-5/12	61	37	1.22
5/13-5/19	66	45	2.17
5/20-5/26	54	39	3.30
5/27-6/2	73	42	.00
6/3-6/9	80	48	.37
6/10-6/16	77	50	1.30
6/17-6/23	82	60	.44
6/24-6/30	73	53	.65
7/1-7/7	77	54	2.16
7/8-7/14	75	55	2.73
7/15-7/21	78	56	0.14
7/22-7/28	74	47	1.11
7/29-8/4	73	51	1.04
8/5-8/11	74	54	3.49
8/12-8/18	75	55	.55
8/19-8/25	79	52	.03
8/26-9/1	67	52	2.34
9/2-9/8	61	45	.86
9/9-9/15	72	49	.57
9/16-9/22	69	50	.45
9/23-9/29	55	38	.91
9/30	54	41	.00
TOTAL			28.58

Table 5. Yields, tuber size, distribution, and quality characteristics of clones harvested 100 days after planting on Aroostook Farm.

Pedigree	MKT CWT	% MKT	% Culls	% Marketable				Tuber Rating	SP. GR.	2/		50°F 3/		TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	3-1/4"-4"			Chip	FF			
B6987-43	286	95	2	18	46	32	4	1	92	5.9	5.9	1.8	1.4	
B7621-2	410	98	2	16	78	3	3	1	83	8.8	8.8	3.8	2.0	
B7805-1	356	94	3	13	57	24	6	2	80	9.7	9.7	4.7	2.2	
B7828-18	364	98	1	9	47	30	15	1	87	9.9	9.9	4.4	2.1	
B7840-2	341	94	3	16	58	18	9	2	71	8.9	8.9	4.1	2.1	
B7871-5	433	98	1	11	50	29	11	2	71	9.5	9.5	4.5	2.5	
B7918-3	372	91	5	28	59	10	2	2	75	9.7	9.7	5.0	2.1	
B8123-12	323	96	2	16	57	23	5	2	78	7.5	7.5	3.2	2.2	
B8229-1	426	96	3	15	62	18	5	1	69	10.0	10.0	5.0	2.2	
B8302-5	403	95	3	7	71	17	5	2	64	9.3	9.3	4.3	2.5	
B8354-11	248	91	4	31	63	6	0	0	85	6.9	6.9	2.6	1.8	
B8359-2	333	93	3	35	60	5	0	1	91	7.2	7.2	3.3	1.9	
B8393-8	271	81	8	56	42	3	0	0	74	10.0	10.0	5.0	2.7	
I. Cobbler	364	92	5	35	54	9	2	1	82	8.4	8.4	4.0	1.9	
Monona	325	93	3	24	67	5	5	2	77	7.3	7.3	2.5	2.0	
Superior	395	98	2	16	61	21	2	3	85	8.5	8.5	4.1	2.0	
LSD .05	42								3.97					

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 6. Yields tuber size, distribution and quality characteristics of clones harvested 110 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	MKT. %	Culls %	% Marketable				Tuber Rating	1/ SP. GV.	50°F 3/ Color		TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	4"			Chip	FF	
B6951-1	348	92	4	31	60	11	0	3	85	9.5	4.4	2.2
B7024-6	325	93	3	37	51	12	5	2	93	7.6	2.5	2.0
B7152-3	286	93	3	40	48	5	0	3	76	8.2	3.1	2.1
B7200-33	488	91	6	39	52	10	0	3	64	9.5	4.1	2.9
B7552-3	395	94	3	22	69	12	0	2	82	8.6	4.2	2.3
B7608-4	372	89	4	31	54	17	0	2	73	10.0	3.9	2.5
B7897-1	364	89	6	47	49	4	0	2	79	7.1	2.7	2.0
B8004-8	372	94	3	23	65	10	2	1	72	9.0	4.0	2.1
B8188-6	387	96	2	32	58	10	0	2	72	9.0	4.0	2.0
B8429-9	356	92	4	22	59	20	2	2	72	7.2	2.2	2.0
B8514-18	464	95	3	17	58	17	8	1	82	9.8	4.5	2.0
B8543-9	325	93	3	24	60	17	2	2	82	6.9	2.6	2.0
B8543-11	348	92	4	24	58	18	2	2	77	8.7	2.9	2.0
B8578-21	333	93	3	24	57	21	0	1	81	8.0	3.7	2.0
B8581-1	341	94	5	45	50	5	0	2	79	8.4	3.0	2.0
Cobbler	348	96	2	18	58	20	4	1	83	9.2	4.0	2.0
Monona	348	96	3	22	60	18	2	2	71	5.5	2.0	1.9
Superior	395	96	2	20	61	16	4	2	82	8.6	3.6	2.0
LSD .05	52											

52

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF1-3 satisfactory; Tex., 1-2 satisfactory

Table 7. Yields, tuber size, distribution and quality characteristics of clones harvested 110 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	% MKT.	% Culls	% Marketable				Tuber Rating	1/ SP. GV.	2/ SP. GV.	50°F 3/		FF TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	4"				Chip	FF	
B7139-4	372	96	2	14	61	16	8	2	97	8.5	3.3	1.9	
B7200-26	372	94	3	24	57	12	6	2	82	7.3	2.9	2.2	
B7620-4	449	97	2	14	52	22	12	2	86	8.6	4.1	2.5	
B7664-2	294	93	3	32	59	5	3	2	84	8.4	3.4	2.0	
B7768-4	356	94	2	20	63	13	14	2	87	9.1	3.8	2.1	
B7828-3	317	98	1	19	64	10	7	2	88	8.7	4.0	1.9	
B7839-7	395	98	2	16	59	18	8	2	80	10.0	4.9	2.3	
B7845-10	279	88	5	35	46	14	5	2	78	8.4	3.4	2.4	
B7863-6	395	96	2	12	56	15	17	1	83	9.3	4.4	2.0	
B7866-3	325	95	2	18	55	13	13	2	79	9.2	4.0	1.7	
B7888-8	317	91	4	23	42	32	4	2	76	9.5	4.2	2.1	
B7902-4	403	95	2	13	55	23	9	2	72	9.6	4.6	2.0	
B7902-9	372	96	2	14	60	25	10	2	86	9.3	4.0	2.3	
B7939-4	387	96	3	14	46	26	14	2	76	8.6	3.5	1.9	
B8019-4	364	96	2	15	53	23	9	3	77	9.9	4.8	2.0	
I. Cobbler	379	94	3	24	54	12	10	1	82	8.5	3.9	2.1	
Monona	341	96	2	18	54	18	9	2	74	7.7	2.7	2.1	
Superior	418	98	1	15	61	18	6	3	84	8.2	3.8	2.0	
LSD .05	45						4.0						

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 8. Yields, tuber size, distribution, and quality characteristics of clones harvested 110 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	% MKT.	% Culls	% Marketable				Tuber Rating	1/ SP. GV	2/ SP. GV	50°F 3/ Color		TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	4"				Chip	FF	
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	4"				Chip	FF	
B8036-1	333	91	4	25	54	18	2	1	76	10.0	10.0	5.0	2.4
B8073-3	426	95	3	20	54	20	7	0	75	10.0	10.0	4.8	2.2
B8123-3	248	90	5	33	50	13	4	1	87	8.6	8.6	4.0	2.0
B8185-4	441	93	5	28	46	18	9	2	77	9.4	9.4	4.1	2.1
B8261-3	371	94	3	21	63	17	0	3	73	8.8	8.8	3.6	2.8
B8262-2	255	85	5	36	57	15	0	2	76	9.6	9.6	4.2	2.2
B8264-1	356	94	4	17	50	30	2	1	75	9.4	9.4	4.1	2.1
B8275-15	325	95	2	31	64	5	0	2	97	7.2	7.2	2.6	1.9
B8280-11	302	87	6	52	38	8	2	1	85	8.8	8.8	3.9	2.3
B8302-3	341	92	5	37	51	9	2	2	72	9.4	9.4	4.0	2.5
B8308-5	364	96	1	21	62	14	2	2	84	10.0	10.0	4.7	2.0
B8314-9	333	91	4	34	50	14	2	1	98	7.0	7.0	2.3	2.0
B8392-7	302	98	1	8	54	33	5	3	83	8.4	8.4	3.6	2.0
B6503-2	302	95	2	22	62	13	3	3	88	6.1	6.1	2.0	2.0
I Cobbler	387	93	4	25	55	18	2	2	77	8.6	8.6	3.6	2.0
Monona	317	93	3	27	58	15	0	3	73	7.0	7.0	2.5	2.0
Superior	403	98	2	15	65	17	2	3	84	8.6	8.6	3.9	2.1
LSD .05	50								3.9				

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 9. Yields, tuber size, distribution and quality characteristics of clones harvested 120 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	%	Culls	% Marketable				Tuber Rating	1/ SP. GV.	2/ Color		TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	4"			Chip	FF	
B6969-2	395	94	3	14	64	19	4	3	70	8.9	4.0	2.2
B7009-4	503	94	5	18	57	20	5	2	73	10.0	4.6	2.0
B7160-4	325	86	7	40	56	5	0	2	75	9.2	3.9	2.0
B7516-9	426	95	3	18	48	27	7	3	72	9.0	4.0	2.2
B7608-2	294	84	7	38	54	8	0	2	70	9.8	4.1	2.2
B7802-2	395	94	3	17	60	17	6	2	72	8.3	3.6	2.0
B7859-2	418	92	4	22	56	16	6	2	75	8.5	3.7	2.3
B7902-4	426	96	2	12	54	23	11	2	68	10.0	5.0	2.2
B7902-9	426	96	2	11	64	24	2	2	79	9.0	4.2	2.2
B8392-5	488	97	2	12	53	25	9	3	83	8.4	3.8	2.0
BR6626-5	449	94	4	20	52	19	8	1	79	9.8	4.6	2.1
BR6862-2	372	94	3	15	50	31	4	2	83	8.3	3.7	2.1
BR6863-3	325	93	3	11	49	31	9	1	81	8.2	3.0	2.0
B6987-29	403	96	3	17	54	21	8	2	90	6.8	2.4	2.0
B6987-56	433	95	3	19	56	21	4	2	95	7.6	3.0	2.0
Pungo	418	95	3	20	57	15	7	2	77	9.2	4.2	2.1
Sebago	387	94	3	22	59	16	4	2	79	8.2	3.2	2.0
Superior	433	97	2	18	59	18	5	2	75	8.7	3.7	2.0
Kennebec	457	95	3	12	52	22	15	1	80	8.0	3.1	2.0
Katahdin	426	95	3	16	58	22	4	2	78	8.8	3.6	2.1
LSD .05	41								4.2			

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 10. Yields, tuber size, distribution and quality characteristics of clones harvested 120 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	% MKT.	% Culls	% Marketable				Tuber Rating	1/ SP. GV.	2/ 50°F 3/		TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4" > 4"	7			Chip	FF	
B6955-35	310	89	5	34	58	7	0	2	92	7.0	2.1	1.7
B7165-8	441	95	4	30	58	10	2	3	86	7.8	3.0	2.0
B7167-2	286	93	3	26	60	13	0	3	89	7.2	2.8	1.8
B7516-7	356	96	2	15	63	20	2	3	92	8.9	3.2	2.0
B7573-3	372	94	3	16	32	20	2	2	84	8.6	3.4	2.0
B7584-12	364	96	1	21	69	8	2	2	92	5.8	2.0	1.6
B7592-1	403	96	3	22	58	13	7	3	81	8.6	3.8	2.0
B7618-6	364	96	2	17	67	15	0	2	81	8.2	3.1	2.0
B7620-7	457	97	2	10	58	29	3	2	84	8.8	3.8	2.0
B7631-8	263	92	3	28	60	14	0	2	79	7.8	3.0	1.9
B7636-22	379	96	2	18	51	22	10	2	79	10.0	4.8	2.1
B7744-5	410	95	3	18	56	18	7	3	82	9.6	4.3	2.0
B7763-3	511	94	4	18	61	17	4	2	76	9.8	4.8	2.6
B7828-10	333	98	3	26	67	7	0	2	95	8.6	3.4	1.8
Katahdin	426	96	2	9	50	32	9	3	80	9.2	3.9	2.0
Kennebec	426	93	4	12	49	25	14	1	85	8.4	3.2	2.0
Hudson	457	95	2	10	44	31	15	2	79	10.0	4.6	2.1
Norchip	387	94	4	29	57	12	2	2	86	8.2	2.8	2.0
LSD .05	50								3.9			

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 11. Yields, tuber size, distribution and quality characteristics of clones harvested 120 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	% MKT.	% Culls	% Marketable			Tuber Rating	1/ SP. GV.	2/ SP. GV.	50°F 3/ Color		FF TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4" >4"				Chip	FF	
B6951-5	333	93	3	21	57	21	2	73	73	9.0	3.9	2.4
B6955-4	395	96	2	18	63	16	4	87	87	8.1	3.4	1.8
B7152-1	348	93	4	22	58	18	2	74	74	9.5	3.4	2.0
B7154-10	379	94	4	20	55	16	8	70	70	8.8	3.0	2.0
B7572-4	372	96	2	16	61	18	4	99	99	9.0	3.2	1.7
B7595-3	341	91	4	24	56	16	4	72	72	10.0	3.9	2.0
B7595-7	403	92	5	32	55	9	4	74	74	9.0	3.8	2.3
B7603-8	364	88	6	32	55	13	0	76	76	9.2	3.2	2.1
B7679-9	387	92	3	17	66	15	2	79	79	10.0	2.0	2.3
B7694-1	341	89	6	40	54	5	2	77	77	7.8	2.3	2.0
B7865-12	348	83	9	41	46	11	2	77	77	10.0	4.9	2.8
B8086-3	395	94	3	19	49	26	6	83	83	9.5	4.0	2.0
B8091-8	395	92	8	36	50	12	2	79	79	10.0	4.0	2.0
Katahdin	410	96	2	11	51	34	4	78	78	10.0	4.5	2.1
Kennebec	433	94	3	12	49	23	16	81	81	9.5	3.5	2.0
B6987-56	410	94	3	28	57	15	0	96	96	7.8	2.0	1.3
Hydson	441	96	2	12	45	28	16	73	73	10.0	4.7	2.0
Norchip	402	92	5	31	57	12	0	82	82	7.7	2.8	1.9
LSD .05	41											

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 12. Yields, tuber size, distribution and quality characteristics of clones harvested 120 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	%	MKT	%	Culls	% Marketable				Tuber Rating	1/ SP. GV.	2/ Color		TEX
						1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	4"			Chip	FF	
B7828-13	387	96			2	14	58	28	1	2	91	9.2	3.7	2.0
B7828-19	356	96			2	15	62	19	4	2	79	7.8	3.1	1.8
B7838-5	449	91			6	31	53	14	3	2	87	8.4	2.9	2.0
B7845-4	403	87			8	35	58	8	0	2	82	10.0	4.8	2.4
B7863-2	372	94			3	14	69	12	6	2	81	9.1	4.0	2.0
B7910-6	488	97			3	15	55	23	8	2	68	9.8	4.5	2.3
B7902-2	325	91			4	29	62	10	0	2	76	10.0	4.7	2.1
B7929-3	310	89			4	34	58	7	0	2	82	8.4	3.2	2.3
B7930-2	433	95			4	26	58	10	5	2	81	10.0	4.3	2.3
B7978-1	410	95			3	24	62	13	0	3	87	9.0	3.6	2.0
B8024-1	395	96			5	26	63	12	0	2	68	9.8	4.2	2.4
B8101-3	333	90			5	31	53	13	2	2	78	9.4	4.2	2.4
B8125-5	410	93			4	22	53	15	11	2	83	8.9	4.1	2.2
B8148-4	348	92			5	26	61	11	2	2	74	8.4	4.0	2.0
Katandin	372	94			3	15	58	19	8	2	79	9.2	4.6	2.0
Kennebec	457	95			3	10	53	22	15	1	81	8.4	3.4	2.0
Hudson	449	97			2	10	53	27	10	2	78	9.5	4.6	2.0
Norchip	364	92			5	32	55	11	2	2	82	7.8	2.3	2.0
LSD .05	53										3.7			

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 13. Yields, tuber size, distribution and quality characteristics of clones harvested 120 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	% MKT.	% Culls	% of Marketable			Tuber Rating	1/ SP	2/ GV		50°F 3/ Color		FF TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	2-1/4"-4" > 4"					Chip	FF	
B8178-4	348	90	5	47	47	6	2	85	85	8.5	4.3	4.3	2.0
B8181-1	356	84	9	49	43	8	1	79	79	9.3	4.0	4.0	2.8
B8188-1	302	93	3	28	58	12	1	85	85	8.3	3.6	3.6	2.0
B8188-9	503	96	3	11	56	30	2	80	80	9.6	4.3	4.3	2.4
B8352-3	371	94	3	29	60	8	1	74	74	9.2	3.7	3.7	2.6
B8392-5	449	98	2	12	53	29	4	86	86	8.7	3.8	3.8	2.3
B8393-6	403	91	6	40	55	4	2	79	79	9.7	4.4	4.4	2.5
Katahdin	410	96	2	13	62	19	2	79	79	9.1	4.0	4.0	2.2
Kennebec	433	98	3	12	59	18	1	85	85	9.2	3.7	3.7	2.0
Hudson	433	97	2	14	52	29	1	78	78	9.5	5.0	5.0	2.1
Norchip	395	94	4	23	60	17	2	85	85	7.9	2.9	2.9	2.0
LSD .05	41							3.2					

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 14. Yields, tuber size, distribution and quality characteristics of clones harvested 120 days after planting on Aroostook Farm.

Pedigree	MKT. CWT.	% MKT.	% Culls	% Marketable			Tuber Rating	1/ SP. GR.	50°F 3/		FF TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"			Chip	Color	
B8212-1	348	88	6	37	46	13	4	76	10.0	4.9	2.1
B8393-1	372	92	4	18	37	37	8	75	9.5	4.3	2.1
B8424-10	410	93	4	20	50	20	10	73	9.2	4.2	2.0
B8429-1	356	96	2	13	57	23	6	82	9.0	3.6	1.9
B8435-17	472	95	3	15	56	21	8	83	9.4	3.9	1.9
B8477-4	356	96	3	21	55	19	4	92	6.3	2.6	1.9
B8529-3	325	91	4	38	52	10	0	87	8.2	3.0	2.0
B8575-5	426	98	1	9	45	34	11	76	9.5	3.9	2.4
B8590-11	379	96	2	26	53	16	4	76	8.1	3.2	2.2
B8599-42	379	98	2	12	51	28	8	74	8.9	3.3	2.1
B8615-1	426	95	3	16	56	24	4	96	10.0	4.0	2.0
B8616-7	372	96	2	23	58	17	2	73	9.9	4.0	2.1
B8497-36	426	95	3	14	49	29	7	88	9.0	3.8	1.9
Katahdin	364	96	2	9	53	24	13	79	9.5	3.7	2.0
Kennebec	410	96	3	17	51	21	11	81	8.9	3.6	2.0
B6987-56	387	96	2	22	61	14	4	98	7.5	2.2	1.5
Hudson	433	97	2	12	43	32	13	75	10.0	4.5	2.0
Norchip	379	92	4	33	53	10	4	84	8.1	2.0	1.8
LDS .05	53										

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 15. Yields, Tuber size distribution and quality characteristics of clones harvested 120 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	% Culls MKT.	%	% of Marketable					Tuber1/ Rating	SP.2/ GRAV	50°F 3/		40-70°F		FF TEX
				1-7/8-2-1/4"	2-1/4-3-1/4"	3-1/4-4"	3-1/4-4"	3-1/4-4"			Color	FF	Color	FF	
B6955-35	294	90	3	23	56	9	12	2	89	7.7	2.8	6.6	2.0	1.9	2.0
B6987-43	286	93	1	13	53	29	5	1	86	6.6	2.4	6.7	2.0	1.9	1.9
B6987-56	379	96	2	20	61	14	4	3	91	8.1	2.7	6.6	1.8	1.9	1.9
B6987-57	302	98	1	13	62	26	0	2	92	8.7	3.2	6.0	2.0	1.9	1.9
B6987-131	209	85	4	43	50	7	0	2	85	7.7	2.8	6.6	1.7	1.9	1.9
B6987-136	356	96	2	15	51	23	11	2	93	7.9	2.8	6.4	2.4	1.8	1.8
B6987-145	286	95	1	13	58	26	3	3	85	7.4	3.0	6.0	2.0	1.9	1.9
B6987-148	310	98	2	12	45	38	5	1	97	7.0	2.1	6.5	2.0	2.0	2.0
B6987-162	317	95	2	17	63	14	5	1	89	6.1	2.0	6.2	2.2	2.0	2.0
B6987-184	302	93	3	28	54	15	3	2	96	7.0	2.5	6.6	2.0	2.2	2.2
B6987-224	317	95	2	15	49	24	12	2	82	8.8	3.1	6.9	2.4	2.2	2.2
B7897-1	325	88	5	30	60	7	3	2	75	9.9	4.0	8.0	3.1	2.2	2.2
B7929-11	310	93	3	20	55	22	3	2	82	9.4	4.6	8.1	3.6	2.8	2.8
Kennebec	372	94	3	14	54	19	13	1	81	9.0	4.4	7.8	3.2	2.0	2.0
Monona	310	93	2	17	52	24	7	2	74	8.0	3.4	6.8	2.4	2.6	2.6
Norchip	348	94	4	26	54	13	7	2	81	8.8	3.7	7.0	3.0	2.0	2.0
LSD .05	28.8								3.7						

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 16. Yields, tuber size, distribution and quality characteristics of russet clones harvested 100 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	%	MKT. Culls	% of Marketable			1/ Tuber Rating	2/ SP. GV.	50°F 3/ Color		FF TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"			Chip	FF	
B7629-1	387	94	1	11	60	23	6	78	9.6	4.8	2.2
B7848-19	310	98	1	18	70	12	0	83	8.2	3.7	2.0
B7902-8	333	96	2	21	65	14	0	87	9.4	5.0	2.0
B8285-2	279	95	2	22	54	16	8	82	8.5	3.2	1.8
B8339-4	387	94	3	14	61	24	2	71	9.0	4.7	2.0
B8357-4	341	94	3	33	53	11	2	96	9.8	4.3	2.0
Norgold Russet	364	92	4	29	58	10	2	78	9.6	4.5	2.0
Russet Burbank	317	85	6	39	51	10	0	88	9.0	4.0	1.7
LSD .05	36							3.1			

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 17. Yields, tuber size, distribution and quality characteristics of russet clones harvested 110 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	% MKT.	% Culls	% Marketable				Tuber ⁻ Rating	1/ SP.	2/ SP.	50°F 3/ Color			TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	4"				Color			
											Chip	FF		
B7637-9	325	93	3	37	56	6	6	3	83	9.5	4.2	2.0		
B7678-17	348	90	5	38	56	7	0	2	82	7.8	3.3	2.4		
B7783-6	341	94	3	27	54	14	4	2	78	8.2	3.8	2.0		
B7802-2	403	96	3	15	64	17	4	3	79	8.5	4.0	2.0		
B7813-5	279	88	6	42	50	8	0	2	78	8.4	3.5	2.0		
B8281-4	333	96	3	19	67	12	2	1	86	8.5	3.9	2.1		
Norgold Russet	364	92	4	23	58	11	8	3	79	9.3	4.0	2.1		
Russet Burbank	341	88	7	32	52	11	4	3	94	8.3	3.8	2.0		
LSD .05	56								3.4					

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 18. Yields, tuber size, distribution and quality characteristics of russet clones harvested 120 days after planting on Aroostook Farm.

Pedigree	MKT. CWT	% MKT.	% Culls	% of Marketable			Tuber Rating	1/ SP. GV.	2/ SP. GV.	50°F 3/ Color		FF TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4" >4"				Chip	FF	
B7147-8	302	93	3	26	66	8	2	89	89	8.8	3.9	2.1
B7147-15	325	98	2	12	60	19	2	102	102	9.3	4.3	2.1
B7147-40	271	92	3	31	63	6	2	82	82	8.5	3.1	2.3
B7160-4	310	87	6	28	65	5	3	78	78	8.9	3.9	2.0
B7196-74	356	94	3	15	65	17	2	74	74	9.7	4.7	2.3
B7583-6	387	98	2	16	66	16	2	92	92	9.5	4.4	2.0
B7608-2	294	88	5	32	63	5	2	72	72	9.7	3.9	2.1
B7644-1	271	85	6	37	57	6	2	81	81	8.1	3.6	2.2
B7666-2	356	88	6	13	61	17	2	75	75	9.2	4.1	2.2
B7679-11	410	90	6	31	60	7	3	77	77	10.0	5.0	2.0
B7680-6	271	85	6	43	51	6	2	79	79	9.8	4.4	2.0
Russet Burbank	379	88	7	29	63	8	2	94	94	8.5	3.3	2.0
LSD .05	34							3.0				

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

Table 19. Yields, tuber size, distribution and quality characteristics of russet clones harvested 120 days after planting on Aroostook Farm.

Pedigree	NKT. CWT	% MKT.	Culls	% of Marketable				Tuber Rating	1/ SP. GV.	2/ Color		FF TEX
				1-7/8"-2-1/4"	2-1/4"-3-1/4"	3-1/4"-4"	4"			Chip	FF	
B7680-10	236	92	4	38	53	9	0	2	77	8.1	3.5	2.0
B7680-12	341	90	5	24	58	16	2	2	74	8.7	4.4	2.4
B7845-29	286	84	7	46	51	3	0	2	75	9.1	4.4	2.2
B7848-23	240	89	4	32	58	10	0	3	85	9.5	4.0	2.0
B8218-4	286	88	5	24	63	10	3	2	81	9.5	4.4	2.1
B8280-8	333	90	5	29	62	10	0	2	87	9.7	4.7	2.1
B8281-5	294	88	5	36	54	8	3	3	98	8.1	3.8	2.0
B8285-3	271	88	5	33	53	14	0	2	79	9.5	4.6	2.2
B8310-13	294	88	5	46	46	8	0	3	82	10.0	4.3	2.2
B8316-3	341	86	7	30	57	14	0	2	79	8.5	3.7	2.2
B8318-4	248	80	8	50	44	6	0	3	81	9.1	4.0	2.1
B8357-1	410	95	3	28	66	6	0	3	91	9.5	4.7	2.3
Russet	317	87	7	37	49	12	2	2	93	8.4	3.4	1.9
Burbank												
LSD .05	40								4.3			

1/ 0 = Very poor to 5 = Outstanding

2/ 1.0 omitted

3/ Chips, 1-7 satisfactory; FF 1-3 satisfactory; Tex., 1-2 satisfactory

USDA, Presque Isle, Maine

James Frank, David Wilson, and R. E. Webb

Disease Resistance Evaluations

Disease resistance testing is carried out on Aroostook Farm at Presque Isle, Maine. Each test is located in its own isolated plot to prevent interference from other disease tests. The general procedures for each test are presented along with the disease reactions obtained in 1976 for all cultivars tested.

The 1976 growing season in Presque Isle, Maine was abnormally wet, compared to an abnormally dry year in 1975. The 1976 rainfall recorded was: May - 6.2, June - 2.8, July - 6.6, and August - 6.8; compared to 1975's recorded rainfall: May - 2.1, June - 2.9, July - 2.8, and August - 2.1. Temperatures were also below normal, with the following monthly averages for maximum temperatures in 1976: May - 62, June - 77, July - 76, and August - 73. The damp, cool conditions favored the growth of the wilt organism, Verticillium, and Rhizoctonia. While these conditions also favored Rhizoctonia disease development, the wilt symptoms were suppressed because of adequate water supply. The conditions also favored the late blight development but suppressed scab development. With the abundance of moisture, the scab test was extremely poor and the results have been deleted from this report. The Verticillium and pinkeye disease tests were twice the normal size in 1976, since many clones were re-evaluated due to test failure in 1975.

Resistance to Verticillium wilt (Verticillium albo-atrum, DM). Seed of the test clones are cut in the field, dipped into spore suspensions of Verticillium (80,000 spores/ml), planted and immediately covered to prevent dessication of spores. Once wilt symptoms are evident in the test plot, ratings are made on a weekly basis. Clones are evaluated on a 0-9 scale, with nine indicating healthy plants and zero signifying plant death (note that in 1975 the values for the 0-9 scale were reversed, with zero indicating no disease). The final disease ratings for the control plants were: Kennebec (S) - 2.5, Cherokee (S) - 3.0, and Abnaki (R) - 8.0.

After the potato plants have been damaged by frost and meaningful wilt data is no longer feasible, the tubers are dug and placed in mesh bags. Within one month after harvest, the tubers are washed, counted, and evaluated for pinkeye disease. The data is reported as percentage of tubers with pinkeye. The ratings for the controls were: Kennebec - 43.2, Cherokee - 9.1, and Abnaki - 14.3 percent.

Resistance to Late Blight (*Phytophthora infestans*). Test clones were planted along with the variety Green Mountain, which served as a susceptible spreader. The Green Mountains were planted as guard rows and every third row in the plot. The plot consisted of two replications of a two-hill plot. The plot was inoculated with a zoospore suspension, field isolation (unknown race) in the second week of July and twice a week thereafter until the Green Mountains showed a heavy infection. Readings were taken once a week until plants were ready for harvest. Readings were made on a 0-9 scale with nine indicating no disease and zero signifying complete susceptibility. Races 0, 1, 2, 1-2, and 1-2-4 were detected throughout the plot by means of indicator plants. Final disease ratings for the controls were: Atzimba (R) - 9.0, Kennebec (S) - 4.5, and Sebago (S) - 0.0.

Resistance to Early Blight (*Alternaria solani*). This field test consisted of two-hill plots, replicated twice with the guard rows, and every third row throughout the plot planted with a susceptible spreader (B5281-1). The plot was not inoculated because a heavy natural infection spread over the plot in the second week of July. Readings were taken once a week until plants were ready to harvest. Readings were made on a 0-9 scale with nine indicating no disease and zero signifying susceptibility. The final disease ratings for the controls were: Norgold Russet - 0.2, Cobbler - 0.1, and Kennebec - 4.6.

Presque Isle Table 1. Pedigrees tested in disease trials. 1976.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B6930-6		2.5	0.5	15.8
B6951-1			5.0	0.0
B6951-5			5.5	0.0
B6955-8			3.0	7.5
B6955-14			4.0	0.0
B6955-33			4.0	0.0
B6955-35			3.5	29.4
B6969-2			7.0	0.0
B6986-2			4.0	0.0
B6987-2			3.0	3.2
B6987-29			2.0	4.5
B6987-43			6.0	0.0
B6987-56		4.8	3.0	2.4
B6987-57			3.0	1.9
B6987-131			0.5	0.0
B6987-136			5.0	9.6
B6987-145			3.0	12.7
B6987-148			3.0	8.1
B6987-162			3.5	10.7
B6987-184			4.0	9.6
B6987-224			1.5	0.0
B7009-4			7.0	2.4
B7024-6			0.5	0.0
B7138-11			7.5	15.8
B7139-4			4.0	0.0
B7141-1			3.5	17.2
B7147-8			3.5	0.0
B7147-15			3.0	0.0
B7147-40			2.0	0.0
B7148-4		1.0	4.0	40.0
B7151-4			5.0	9.1
B7152-1			2.0	0.0
B7152-3			1.5	16.7
B7152-12			0.5	7.1
B7153-29		1.8	2.0	0.0
B7154-6			2.0	0.0
B7154-10			2.0	0.0
B7155-56			1.0	0.0
B7160-4		1.0	3.5	0.0
B7165-2		2.8	1.0	53.3
B7165-6		4.2	2.0	17.1
B7165-8		3.2	4.0	28.9
B7165-17			7.0	25.0
B7167-2			4.0	0.0
B7167-30			4.0	0.0
B7168-2			3.5	29.4
B7188-56			2.0	0.0

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B7200-26			1.0	0.0
B7200-33	9.0		1.0	17.8
B7252-3		4.0	3.0	10.0
B7578-1			1.0	27.9
B7582-6			7.5	0.0
B7583-6		3.0	5.0	0.0
B7584-10			0.0	0.0
B7607-3			3.0	0.0
B7623-1			1.5	50.0
B7625-20			1.5	0.0
B7629-3			0.5	4.2
B7631-3			5.0	12.8
B7636-4			1.5	10.0
B7636-5			5.0	0.0
B7637-3			3.0	0.0
B7637-7			1.5	0.0
B7637-9			2.5	0.0
B7644-1			6.0	0.0
B7645-12			4.5	0.0
B7655-9			3.0	0.0
B7666-2			1.5	4.3
B7669-2			2.0	20.0
B7684-6			0.0	0.0
B7698-1		4.5		
B7702-1			2.0	5.4
B7711-6	5.0		2.5	0.0
B7711-12			4.0	0.0
B7732-2			4.0	0.0
B7744-4			5.5	15.1
B7763-3		4.0		
B7767-2		2.2		
B7778-14			4.0	0.0
B7802-2		0.0		
B7809-5		3.5		
B7813-5		1.0		
B7845-4		4.0		
B7845-10		0.8		
B7845-14		3.5		
B7845-19		1.8		
B7845-21		2.2		
B7845-26		2.2		
B7845-29			4.0	0.0
AKB7858-6	9.0	5.2	2.0	19.0
B7860-4	9.0		6.5	0.0
B7860-11	7.0		3.0	7.4
B7860-13	8.0		4.0	19.0
B7860-14	4.0		4.5	2.5

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B7860-16	2.0		2.0	0.0
B7860-19	2.0		2.5	0.0
B7860-20			4.0	25.6
B7860-21			2.0	3.0
B7860-23	5.5		6.0	0.0
B7860-26			5.5	5.0
B7860-31	4.0		1.5	48.3
B7860-33			1.5	61.1
B7860-38	5.5		4.0	0.0
B7860-39	5.0		4.5	7.5
B7860-41			2.0	5.0
B7863-1			1.0	0.0
AKB7865-12	9.0	3.2		
B7872-7			3.0	2.8
B7881-3		5.8		
B7888-7		2.8		
B7888-8		0.5		
B7888-9		5.0		
AKB7896-1	9.0		3.0	10.4
B7897-3		3.5		
B7902-9		3.2		
B7902-11		2.5		
B7910-6		2.8		
B7910-7		1.5		
B7913-1		4.8		
B7918-3		0.8		
AKB7925-3	9.0	2.0	3.5	20.0
B7929-3		5.2		
AKB7957-5	3.5		4.5	0.0
B8004-8		3.2	2.0	42.4
B8018-2			4.0	0.0
B8019-4			3.0	0.0
B8019-7		6.0	3.5	50.0
B8024-1			1.0	8.6
B8036-1			5.5	0.0
B8036-4			4.0	0.0
B8050-4			4.5	32.6
B8073-3		3.8	1.0	37.8
B8086-3			1.0	22.9
B8087-6			5.0	0.0
B8088-2			4.0	0.0
B8091-8			3.5	52.0
B8101-3		3.5	3.0	6.7
B8108-3			5.0	0.0
B8123-3		2.8	4.0	3.6
B8123-11		6.2	5.0	25.6
B8123-12		1.0	4.5	0.0

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8125-5			5.0	0.0
B8131-1			5.5	0.0
B8132-4		2.5	3.0	0.0
B8140-1			1.0	0.0
B8148-4		5.8	2.0	66.7
B8154-9			1.0	2.8
B8176-6	9.0		4.0	0.0
B8178-1	9.0		4.0	0.0
B8178-4		2.0		
B8178-9	9.0		3.5	0.0
B8178-12	9.0		4.5	20.0
B8178-19	4.5		2.5	0.0
B8181-1		6.2		
AKB8196-5			6.0	6.8
AKB8196-6			4.5	0.0
AKB8196-7			4.0	50.0
AKB8196-8			3.5	0.0
AKB8206-1			0.5	0.0
AKB8208-12			1.0	0.0
AKB8210-1			2.0	2.5
AKB8210-3			2.0	0.0
AKB8210-6			4.0	0.0
AKB8218-4	5.0		4.0	17.5
AKB8221-1A	4.5		6.0	0.0
AKB8221-1B			4.0	0.0
AKB8221-4			1.0	6.7
AKB8221-19	9.0			
AKB8221-31			4.0	10.0
AKB8222-2			1.0	0.0
AKB8222-9			6.5	0.0
AKB8227-6			4.0	0.0
AKB8227-16			6.5	0.0
B8232-1		5.0		
AKB8232-13S	2.0		2.0	0.0
AKB8232-15S	9.0		0.0	0.0
AKB8232-20S	9.0		4.5	0.0
AKB8232-25S			1.0	0.0
AKB8232-28S			4.0	0.0
AKB8232-51S			3.0	0.0
B8235-5		1.8		
AKB8249-7			2.0	40.5
AKB8250-4			2.5	0.0
B8261-3		1.8		
B8264-1		3.0		
AKB8276-3			2.5	0.0
B8280-11		4.2		
AKB8304-1		5.8		

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
AKB8304-2			3.0	23.6
AKB8304-6			1.5	6.7
B8337-8		3.2		
B8393-6		7.2		
B8393-7		3.2		
B8418-14	6.0		3.5	0.0
B8423-5			3.0	0.0
B8423-6			2.0	23.3
B8424-4	4.0		3.5	39.0
B8424-10	4.0		6.5	0.0
B8424-11	4.0		2.5	0.0
B8424-12			1.5	34.4
B8424-14			3.0	42.5
B8424-15			3.0	27.2
B8425-10			3.5	0.0
B8427-2	7.5		5.5	12.5
B8427-3	6.5		4.0	7.1
B8427-4	6.0		2.0	4.0
B8427-7			4.0	3.6
B8427-8	6.5		8.0	0.0
B8427-11	8.0		9.0	2.4
B8427-14	1.0		4.0	0.0
B8428-1			4.0	0.0
B8428-6	9.0		5.0	0.0
B8428-8	9.0		2.5	0.0
B8428-10	9.0		3.0	0.0
B8429-1			3.5	36.0
B8429-5			4.0	6.7
B8429-9	9.0		1.0	0.0
B8430-3			3.0	0.0
B8430-6			4.0	0.0
B8430-10			3.5	0.0
B8430-14			4.0	0.0
B8432-1	3.0		9.0	0.0
B8433-4	1.0		4.5	13.3
B8434-11	9.0		3.0	0.0
B8434-14	9.0		4.5	0.0
B8434-15	9.0		4.0	14.0
B8434-16	9.0		6.5	3.0
B8435-2	9.0		8.5	0.0
B8435-8			3.5	17.2
B8435-13			4.5	18.7
B8435-17	5.0		4.0	25.0
B8435-18	9.0		4.0	0.0
B8435-20			4.0	0.0
B8443-5	9.0		3.0	0.0
B8443-8	9.0		5.0	9.1

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8443-12	9.0		7.5	15.5
B8459-2			1.5	0.0
B8459-5			3.5	4.3
B8459-6	9.0		6.5	2.5
B8462-1			3.5	0.0
B8462-6	5.5		4.5	2.1
B8462-7	9.0		4.0	16.0
B8467-1			2.0	2.4
B8468-9			1.0	0.0
B8473-1			3.0	5.0
B8475-1			4.5	14.7
B8477-4	3.5		3.0	10.6
B8477-8			4.0	2.2
B8477-10	5.0		3.5	16.7
B8477-11	0.5		2.0	0.0
B8477-12	3.0		4.0	21.6
B8480-1			3.0	2.0
B8480-3			3.0	36.2
B8483-4			3.5	25.0
B8486-1			4.0	2.3
B8489-2			4.0	0.0
B8490-4	3.5		4.5	8.5
B8490-5	4.0		4.0	3.7
B8491-1			8.0	2.7
B8491-6			4.0	4.0
B8491-7			4.0	69.4
B8491-17			4.0	0.0
B8491-19			3.0	0.0
B8491-24			3.0	31.6
B8491-25			6.0	26.1
B8491-42			9.0	29.4
B8497-15	4.0		1.0	10.0
B8497-24	3.0		1.5	11.1
B8497-36			2.5	0.0
B8497-46			0.5	2.4
B8498-9			1.5	2.4
B8498-13			4.0	0.0
B8500-24			1.5	7.5
B8500-27	9.0		1.5	31.3
B8501-6			2.5	0.0
B8501-10			2.5	0.0
B8501-11			2.0	0.0
B8501-16			3.5	24.4
B8501-18			2.0	0.0
B8502-9			5.0	0.0
B8502-12			5.0	0.0
B8503-13			2.0	0.0

Presque Isle Table 1. Pedigrées tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8503-16			1.5	44.4
B8505-1			6.0	0.0
B8507-11			3.0	1.8
B8509-2			1.5	20.0
B8509-15			5.0	4.4
B8509-17			4.5	47.5
B8509-25			5.5	43.6
B8512-12			4.0	15.0
B8514-4			9.0	0.0
B8514-12			1.5	14.0
B8514-13			2.5	15.0
B8514-18			3.0	0.0
B8519-4			3.5	0.0
B8522-11			1.0	0.0
B8524-1	6.5		1.0	0.0
B8524-4			1.0	0.0
B8524-21	9.0		0.5	0.0
B8524-27	9.0		3.0	0.0
B8525-3			3.0	0.0
B8525-5			1.0	0.0
B8525-10			1.0	0.0
B8525-18			2.0	0.0
B8527-3	2.0		1.0	0.0
B8527-4			2.0	0.0
B8528-3			3.0	0.0
B8528-4	9.0		4.0	0.0
B8529-3	4.5		4.0	2.1
B8529-4			3.0	5.8
B8529-12			3.5	0.0
B8529-17			6.0	0.0
B8530-4			9.0	0.0
B8530-7			7.0	0.0
B8530-8			4.0	0.0
B8530-9			4.0	0.0
B8540-7			2.5	0.0
B8542-5			2.5	23.3
B8542-7			4.5	0.0
B8542-10			7.5	0.0
B8542-16			1.5	4.8
B8542-22			3.5	13.3
B8543-6			2.0	40.0
B8543-9			3.5	10.3
B8543-11			3.0	0.0
B8543-16			3.0	12.5
B8543-26			2.5	13.3
B8545-1			5.0	2.5
B8545-18			2.0	0.0

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8546-6	9.0		5.0	16.9
B8548-20			4.0	0.0
B8548-21			2.5	0.0
B8553-10			5.0	0.0
B8566-4			5.0	6.3
B8568-9			3.5	0.0
B8568-19			3.5	0.0
B8574-10	9.0		1.0	0.0
B8575-5			6.0	43.3
B8577-1			4.0	0.0
B8578-4			0.5	0.0
B8578-8			3.5	20.7
B8578-21			3.5	11.8
B8579-1			3.5	0.0
B8579-15			3.5	0.0
B8581-1			3.0	34.1
B8582-2			4.0	35.7
B8584-1			4.5	4.8
B8588-1			3.5	5.7
B8588-4			3.5	20.0
B8590-5	1.5		5.0	40.0
B8590-11	7.0		3.5	18.9
B8596-4			1.5	7.9
B8598-5			2.5	10.0
B8598-8			2.0	5.0
B8598-9			1.0	6.4
B8599-16			0.5	0.0
B8599-18			3.5	0.0
B8599-40			1.5	8.3
B8599-42			1.5	8.1
B8599-45			1.0	13.7
B8604-1			3.0	6.4
B8612-1			3.5	19.0
B8612-2			2.5	10.0
B8614-5			5.5	22.9
B8614-10			2.5	4.7
B8614-12			4.5	17.9
B8615-1	1.5		4.5	12.5
B8615-2			0.5	0.0
B8616-7			0.5	8.9
B8618-5			3.5	33.3
B8625-11			3.5	87.0
B8625-13			1.0	28.9
B8625-15	4.0		8.0	48.5
B8625-16			5.5	5.9
B8626-2			4.0	0.0
B8641-1	9.0		3.5	4.8

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8641-8	9.0		3.5	35.6
B8642-2			3.0	0.0
B8680-4			3.0	26.5
B8681-5			2.5	42.2
B8681-7			1.0	9.3
B8682-1			4.5	18.8
B8682-2			1.0	0.0
B8682-4			1.5	0.0
B8682-5			2.0	0.0
B8682-8			4.0	24.0
B8683-1			2.0	0.0
B8683-2			1.5	20.0
B8683-3			3.5	11.5
B8683-5			2.0	83.9
B8684-1			3.5	N.T.
B8685-2			3.0	84.3
B8685-3			1.5	22.6
B8685-4			0.0	77.3
B8685-5			0.5	18.8
B8686-2			3.5	100.0
B8686-7			4.5	9.2
B8686-8			5.0	0.0
B8687-4			4.0	32.0
B8687-5			3.5	25.7
B8687-7			2.0	67.9
B8687-10			4.5	7.7
B8687-16			0.5	22.0
B8687-20			3.5	18.6
B8687-22			3.5	60.0
B8687-23			3.0	13.2
B8687-24			2.0	0.0
B8688-1			0.5	0.0
B8688-2			4.0	0.0
B8688-4			2.5	9.1
B8688-5			3.5	0.0
B8688-6			1.5	4.0
B8689-1			1.5	100.0
B8689-3			3.0	9.4
B8689-5			1.0	0.0
B8689-6			3.5	0.0
B8690-2			3.0	0.0
B8690-6			4.5	0.0
B8690-7			2.5	33.3
B8690-12			3.0	8.3
B8690-13			1.0	0.0
B8690-17			1.0	0.0
B8691-3			1.0	0.0

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8691-8			3.5	0.0
B8691-10			2.5	25.5
B8691-13			4.5	54.8
B8691-16			1.5	0.0
B8691-18			4.0	0.0
B8691-22			2.5	57.1
B8691-29			3.0	11.5
B8692-3			2.5	57.5
B8692-6			4.0	22.5
B8692-11			1.5	17.0
B8692-12			3.5	17.8
B8692-14			1.0	6.4
B8693-4			0.5	0.0
B8693-9			0.0	12.1
B8694-2			3.5	14.6
B8694-4			3.0	36.8
B8694-6			2.5	21.9
B8696-1			2.0	12.3
B8696-5			0.5	27.8
B8697-9			3.5	22.2
B8697-18			2.5	52.9
B8697-21			3.0	0.0
B8697-29			0.0	0.0
B8697-34			2.0	0.0
B8698-3			0.0	0.0
B8700-2			0.5	48.1
B8701-2			3.5	100.0
B8704-1			5.0	7.0
B8704-3			2.0	0.0
B8704-4			0.5	15.6
B8704-5			0.0	68.4
B8704-9			0.5	0.0
B8704-11			1.5	0.0
B8704-12			1.5	11.3
B8704-16			0.5	4.3
B8705-8			5.0	53.3
B8706-7			4.5	0.0
B8707-1			0.5	26.5
B8707-5			3.5	23.3
B8709-3			5.0	28.6
B8709-5			1.0	16.1
B8709-9			3.5	10.0
B8710-1			3.5	31.4
B8710-9			0.0	0.0
B8710-11			4.0	29.2
B8710-13			4.0	0.0
B8710-15			3.5	69.0

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8710-16			1.5	30.0
B8710-17			3.5	7.3
B8710-18			2.0	0.0
B8710-19			1.5	5.1
B8711-2			0.5	0.0
B8711-3			0.0	47.9
B8711-7			8.5	0.0
B8712-1			2.0	12.8
B8712-6			2.5	33.3
B8712-9			2.5	32.4
B8713-2			4.0	29.4
B8713-3			3.0	0.0
B8713-5			3.5	26.7
B8713-8			2.5	20.8
B8713-9			2.5	0.0
B8713-10			0.5	48.9
B8713-11			3.0	0.0
B8713-19			0.5	26.3
B8713-20			2.0	0.0
B8713-21			2.5	53.8
B8713-22			4.0	0.0
B8713-24			3.5	0.0
B8713-27			3.5	25.5
B8713-28			4.0	0.0
B8714-4			3.5	18.2
B8714-12			1.5	26.7
B8715-3			2.0	45.0
B8715-6			3.0	42.9
B8715-9			4.0	21.5
B8715-13			5.0	16.3
B8715-14			0.5	4.7
B8715-17			4.5	26.7
B8715-20			3.0	22.7
B8715-22			2.0	4.8
B8717-1			2.0	30.0
B8718-1			2.5	16.7
B8718-2			1.0	0.0
B8718-5			2.5	0.0
B8718-7			0.5	17.5
B8719-8			3.0	53.1
B8720-2			3.5	0.0
B8720-4			3.0	24.0
B8720-5			4.0	0.0
B8721-2			1.5	0.0
B8721-3			2.0	0.0
B8721-4			4.0	20.0
B8721-8			1.5	0.0

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8721-9			4.0	26.7
B8721-12			2.0	0.0
B8721-13			3.0	0.0
B8723-2			3.5	31.1
B8724-2			3.0	0.0
B8733-2			1.0	2.7
B8733-6			3.0	2.2
B8735-1			1.5	0.0
B8735-2			1.0	0.0
B8735-3			2.0	10.3
B8735-4			3.0	0.0
B8735-5			0.0	0.0
B8735-6			4.5	9.3
B8735-7			4.0	21.7
B8736-5			5.0	27.8
B8737-1			1.5	0.0
B8737-4			4.0	0.0
B8739-1			4.5	0.0
B8740-1			1.5	8.3
B8740-2			0.5	0.0
B8741-3			3.5	20.0
B8750-1			2.0	13.3
B8751-2			3.5	0.0
B8751-3			3.0	0.0
B8751-6			2.0	10.6
B8754-2			3.0	0.0
B8755-3			6.5	0.0
B8756-5			4.0	4.0
B8756-6			7.0	0.0
B8757-7			2.5	0.0
B8758-2			3.5	24.0
B8758-5			1.5	0.0
B8758-7			2.5	0.0
B8761-2			2.0	1.9
B8763-2			3.5	0.0
B8763-15			2.5	0.0
B8765-1			1.5	47.1
B8766-1			4.5	0.0
B8767-2			4.0	36.4
B8767-4			4.5	0.0
B8768-1			3.5	0.0
B8768-2			3.5	28.5
B8768-3			3.0	8.0
B8768-4			5.5	13.8
B8769-4			7.5	0.0
B8769-5			0.5	0.0
B8770-2			6.0	0.0

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8770-3			0.0	0.0
B8771-2			9.0	12.0
B8773-10			1.0	0.0
B8773-16			3.0	25.9
B8773-17			7.0	2.8
B8773-19			5.0	18.4
B8773-23			7.0	31.3
B8773-24			0.0	21.4
B8774-2			2.5	17.8
B8775-2			1.5	8.5
B8776-1			2.5	0.0
B8777-1			3.5	0.0
B8777-7			2.0	0.0
B8778-1			2.0	0.0
B8778-4			3.0	0.0
B8779-1			3.0	10.0
B8780-3			1.5	0.0
B8780-6			1.0	0.0
B8782-6			8.0	30.4
B8783-1			0.0	0.0
B8783-2			4.5	0.0
B8783-3			4.5	0.0
B8783-5			7.0	5.9
B8783-6			1.5	12.1
B8783-8			0.5	24.4
B8783-12			4.5	13.2
B8783-15			3.5	0.0
B8784-5			2.0	0.0
B8784-8			1.5	8.7
B8784-11			3.5	0.0
B8784-12			1.5	58.8
B8787-1			3.0	8.0
B8787-3			4.5	0.0
B8787-7			4.0	0.0
B8787-8			4.0	0.0
B8788-5			3.0	60.0
B8789-3			3.5	17.5
B8790-3			1.5	5.7
B8783-1			0.5	52.0
B8794-6			2.5	0.0
B8794-7			2.5	18.0
B8798-3			4.5	4.4
B8798-4			6.5	0.0
B8798-10			0.0	0.0
B8798-16			4.5	0.0
B8798-18			0.5	8.6
B8798-19			3.0	13.6

Presque Isle Table 1. Pedigrees tested in disease trials. 1976. cont.

Pedigree	Late Blight	Early Blight	Verticillium	% Pinkeye
B8798-20			6.5	0.0
B8799-8			3.0	2.2
B8799-9			5.5	0.0
B8799-10			7.5	40.5
B8799-13			2.5	0.0
B8799-16			3.0	2.2
B8800-3			2.0	25.0
B8803-1			1.5	0.0
B8804-4			4.0	30.2
B8806-1			3.5	0.0
B8809-1			1.0	60.0
B8811-3			3.0	2.6
B8812-3			3.5	0.0
B8812-4			3.5	60.0
B8812-8			3.0	3.8
B8812-9			5.5	2.7
B8812-10			0.0	17.5
B8812-13			0.0	0.0
B8812-15			1.5	0.0
B8812-16			3.0	0.0
B8812-21			3.5	0.0
ACC26619-1			2.5	27.3
Kennebec	4.5	4.6	2.5	43.2
Abnaki			8.0	14.3
Atzimba	9.0			
Sebago	0.0			
Cherokee			3.0	9.1
Norgold Russet		0.2		
Cobbler		0.1		

INTER-REGIONAL POTATO INTRODUCTION PROJECT (IR-1)

R. W. Ross and R. E. Hanneman, Jr.

Introduction of New Stocks. Three hundred seventy-four new stocks were received from six countries (Argentina, India, Japan, Netherlands, Scotland, USSR). Most were true seed introductions of Argentine species provided by the collector, K.A. Okada, from the INTA germplasm collection maintained at the Balcarce regional station, Argentina.

Preservation and Increase of Stocks. Approximately 90 percent of the introductions now contained in the collection are maintained as true seed. Satisfactory seed increases of 182 species introductions and intraspecific hybrids were obtained under glass, plastic or screen. Recently harvested seed samples of 180 species introductions were packaged for storage in the National Seed Storage Laboratory.

Germination percentages of 832 seed lots 2-20 years old were determined. A fifty-seedling sample of 314 seed increase lots were grown to detect mechanic admixtures that can happen in the course of the extraction and packaging process.

Classification. Just over 4000 herbarium mounts, representing specific and interspecific specimens of 92 Solanum species, are available for taxonomic use. It now appears that two Solanum taxonomists will spend time here in the course of the 1977 growing season, to annotate or reclassify introductions that have provisional or questionable classifications.

Distribution of Stocks. Seed and tuber shipments were sent to potato workers in 20 states within this country and to those in 19 other countries. Shipments included 2824 seed and 1675 tuber samples of species introductions, and 64 seed and 951 tuber samples of germplasm developed by the cooperative USDA-Wisconsin Genetics and Cytogenetics Project, involving species introductions.

A mimeographed listing of 249 species introductions available in the form of tuber families (mainly for the benefit of those without adequate greenhouse facilities) was distributed to 177 potato workers.

Evaluation of Stocks. Seedling populations of 266 introductions, representing 24 Solanum species, were evaluated in the field for tuberization response to length of day. Seventy frost-tolerant clones, selected from the interspecific hybrid populations evaluated earlier, were again included in the frost-evaluation field planting to allow differential readings. The somatic chromosome numbers of 455 species introductions were determined.

The more recent introductions are being steadily evaluated for characters of economic importance through the cooperative efforts of state, federal, and foreign laboratories.

Usefulness of Findings The major objective of the Potato Introduction Project is to promote and facilitate the improvement of the commercial potato in the United States by providing a readily available reservoir of useful breeding stocks. Breeders are constantly searching for new sources of superior germ plasm and are conducting incessant researches to incorporate desirable new genes into adapted commercial varieties. Accomplishment of the major objective of this program must be measured largely by the success with which new, improved varieties meet the needs of commercial production.

Three new potato varieties with introductions in their pedigree (Alaska Red, Atlantic, Centennial Russet) were released for commercial production in 1976. One hundred thirty-four of the 138 potato varieties developed and released in the United States since 1932 have two or more foreign introductions in their pedigree. These varieties presently compose about 65 percent of the annual seed potato production in the United States.

Basic research programs conducted in several states and other countries continue to provide information concerning the potential value and diversity of the Solanum species, and consequently the knowledge necessary for more effective utilization of the IR-1 germplasm collection. In 1976, 23 papers, 11 abstracts and three theses reported the use of Solanum introductions.

NORTH CENTRAL REGIONAL POTATO TRIALS - 1976

R.H. Johansen and Cooperators^{1/}

The 1976 North Central Regional Potato trial was the twenty-sixth trial planted since its origin in 1951. This year two Provinces in Canada, Alberta and Manitoba, joined the North Central Trial. This makes a total of twelve states or provinces and thirteen trials. Nebraska has two trials, one at Grand Island which is a late summer crop and another at Alliance which is considered a fall crop. Next year Indiana plans to rejoin the North Central Regional Trials.

The North Central Regional Trials have been beneficial in testing and evaluating potato selections over a wide range of environmental conditions. The wide range of environmental conditions extends from Alberta and Manitoba, Canada to Louisiana. The trials have been beneficial in that they point out the weaknesses and the strong points of a certain advanced selection and give the cooperator an opportunity to become familiar with a certain clone long before it is released as a named variety.

Over the past twenty-six years the importance of the trials can be measured by its accomplishments. Of the forty-one potato varieties listed in the 1976 U.S. Certified Seed Report, fifteen of these varieties were first tested in the North Central Regional trials before they were introduced as named varieties, and four of the varieties--Norchip, Superior, Norgold Russet and Norland rank in the top seven in seed production. In Canada eight out of the forty-three varieties grown for certification were also first tested in the North Central Regional Trials. In addition to the importance of the variety releases, Nebraska and other states have obtained valuable genetic data from material grown in the North Central Regional Trials.

Environmental Conditions. Soil type ranged from clay loam to coarse sand. Sandy loam or clay loam was the most common.

Cultural Practices. Fertilizer applications, irrigation, spray programs, vine killing, spacing, etc. were based on local conditions. Insecticides used were Diazinon, Sevin, Thiodan, Clordane, Temik, Cygon, Monitor and Defend. Louisiana used no chemicals to control insects, diseases or weeds. Fungicides used were Maneb, Polyram, Copper Sulfate, Dithane M45, Manzate and Bravo. Eptam, Maloran and Sencor were the most common herbicides used. Vines were killed by frost, roto-beating, rotary mower or by chemical (Dow General).

Growing Conditions. For the Midwest and most of the North Central Region 1976 was one of the driest years on record. In the northern states the season was even dryer than during the drought of the mid-nineteen thirties. It was extremely dry and hot in Alberta and Manitoba. Alberta had below average hours of sunshine during June, July and August but above average hours of sunshine during May and September. Manitoba and the Northern states had much above the long time average of sunshine throughout the growing season. Temperatures varied as Minnesota and Michigan had near normal temperatures while Kansas and Missouri had cool temperatures in June and normal during July; North Dakota, Wisconsin,

^{1/} Kansas, J. Greig; Louisiana, J. Fontenot; Michigan, N. Thompson; Minnesota, F. Lauer; Missouri, V. Lambeth; Nebraska, R. O'Keefe; North Dakota, R. H. Johansen; Ohio, A.R. Mosley; South Dakota, P. Prashar; Wisconsin, J. Shoeneman, D. Kichefski and S. Peloquin; USDA, R. Webb; Alaska, C. Dearborn; Alberta, S. Molnar; Manitoba, W. A. Russell.

Nebraska, South Dakota and Michigan were extremely dry and for most of the season had very high temperatures. Irrigation was common in several states and provinces as Alberta, Michigan, Kansas, Minnesota, Nebraska, South Dakota and Wisconsin all added as much as 25 inches of irrigation water. Kansas had a freeze the first of May which killed plants that were eight to ten inches high back to the ground. Missouri also had a freeze the first week of May. Louisiana had favorable moisture and temperatures throughout the growing season. Although it was warm and dry throughout most of the season in Ohio, cool weather did occur in that state during the latter part of the season. In Ohio the month of May had below normal precipitation but the other months received adequate moisture.

<u>State or Province</u>	<u>Date Planted</u>	<u>Date Harvested</u>	<u>Total days to Harvest</u>
Alberta	May 5	Sept. 20	138
Manitoba	May 20	Sept. 24	127
Louisiana	Feb. 5	May 19	74
Kansas	March 23	Aug. 3	133
Michigan	May 10	Sept. 13	126
Missouri	March 31	Aug. 6	128
Minnesota	April 21	Sept. 22	154
Neb. (Grand Island)	April 6	Aug. 29	145
Neb. (Alliance)	May 17	Sept. 18	124
North Dakota	May 10	Sept. 13	126
Ohio	May 3	Oct. 18	139
South Dakota	April 22	Sept. 20	120
Wisconsin	May 4	Sept. 21	140

As you will note from the above planting and harvesting data Michigan and North Dakota planted and harvested on the same dates (don't know what this means).

Entries. Entries were received from Minnesota, North Dakota, Wisconsin, Alaska and Louisiana. The check varieties supplied by North Dakota were Norland, Russet Burbank, Red Pontiac and Norchip.

Yield. Total and U.S. No. 1 yield are reported in North Central Tables one and two. Trials in Wisconsin, Minnesota and Ohio produced the highest yields and North Dakota and Louisiana produced the lowest yields.

Red Pontiac with an overall average total yield of 459 cwt per acre produced the highest yield. The next highest yielding entry was ND8891-3 which had an average total yield of 413 cwt per acre. Red Pontiac and ND8891-3 also produced the highest U.S. No. 1 yield. Minn. 4536 produced fairly high total and U.S. No. 1 yield.

Percent U.S. No. 1. Percent U.S. No. 1 is reported in North Central Table 3. Most entries with the exception of Russet Burbank produced fairly high percent U.S. No. 1. In the Louisiana trials only ten percent of the Russet Burbanks were U.S. No. 1.

Maturity. Norland was again the earliest maturing entry in trial (North Central Table 4). The latest maturing entries were Russet Burbank, Red Pontiac, La 11-118, AK 28, AK 25 and Wisc. 729R.

Total Solids. AK 25 and Norchip were found to have the highest percent total solids and Norland and Red Pontiac were found to have the lowest percent total solids. Results on total solids are found in North Central Table 5.

Scab Reaction. Kansas showed the highest incidence of scab (North Central Table 6). Other states and provinces reporting scab were Alberta, Manitoba, Louisiana, Michigan, Nebraska, North Dakota, Ohio and South Dakota.

Internal and External Defects. A summary of grade defects are found in North Central Table 7. A particular weakness of a clone or variety is starred only to call it to the attention of the person responsible for its development. Russet Burbank again showed a very high incidence to growth cracks.

Chip Quality. Chip quality is found in North Central Table 8. All the states except Kansas, Missouri and South Dakota reported chip quality. Several new clones had chip quality quite comparable to that of Norchip.

Overall Merit Ratings^{1/}. Merit Ratings are presented for 1974, 1975 and 1976.

<u>Variety</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
ND8891-3		16	45
Wisc. 729R	15	16	26
Wisc. 718	12	26	25
Minn. 4536 ^{2/}			19
Norchip	9	19	13

1/ Merit Ratings

<u>Rating</u>	<u>Points</u>
1	5
2	4
3	3
4	2
5	1

2/ Minn. 4536 was in the 1973 NC trial and received 12 points

North Central Table 1. Total Yield (Cwt/Acre)

Variety	Early to Med.	Early	Alberta	Manitoba	La.	Kansas	Mich.	Mo.	Minn.	Neb.		Ohio	S. Dak.	Wisc.	Ave.
										Late Summer	Fall				
Minn. 4536	321	218				331	398	281	599	342	525	181	449	421	393
ND8913-4Russ	218	133			70	193	208	149	286	347	412	119	277	285	243
ND8751-16	307	205			100	305	247	137	409	312	510	156	362	352	298
Norland	303	217			120	202	327	190	383	263	401	167	352	305	285
<u>Medium to Late</u>															
Norchip	356	235			151	333	326	258	489	425	543	167	507	390	367
W 718	426	213			99	306	349	255	504	492	600	113	408	344	367
W 726	459	240			134	328	321	215	480	398	645	131	426	310	356
W 729R	466	219			131	277	361	231	499	382	552	95	486	383	364
Minn. 3866	363	252				333	354	206	492	437	575	164	427	409	382
Minn. 4858	460	208				324	305	234	448	292	610	165	410	349	368
AK 25	275	236			143	214	363	243	523	259	492	116	507	361	341
AK 28	454	149			112	168	347	227	448	353	437	77	357	306	306
Neb. 42-1	313	230					310	113	405	200	533	70	302	335	307
ND8891-3	413	293			208	368	343	231	532	452	650	148	503	443	413
La 01-70	353	238			140	239	454	255	499	396	514	117	464	361	359
La 11-24	274	199			162	272	287	227	433	349	492	117	332	349	302
La 11-118	321	190			165	288	386	207	533	393	597	120	406	258	347
Red Pontiac	539	304			221	344	465	249	558	402	704	192	622	549	459
Russet Burbank	282	270			178	261	405	235	527	221	565	79	520	388	348
Katahdin												466			
AVERAGE	363	224			142	283	345	218	476	353	545	131	429	363	600

North Central Table 2. U.S. No. 1 Yield (Cwt/Acre)

Variety	Neb.									
	Early	Med.	Early	Alb.	Kansas	Mich.	Mo.	Minn.	Summer	Fall
Early to Med.										
Minn. 4536	250	195			278	386	275	598	260	431
ND8913-4Russ	102	71	45		79	186	142	270	181	300
ND8751-16	209	146	76		139	213	131	392	153	398
Norland	226	196	85		111	309	185	379	210	357
Medium to Late										
Norchip	265	183	124		249	305	251	484	263	396
Wisc. 718	369	191	83		254	329	250	502	355	498
Wisc. 726	395	219	112		291	308	211	478	295	484
Wisc. 729R	415	196	115		226	340	227	495	283	475
Minn. 3866	272	197			214	293	200	488	258	488
Minn. 4858	416	170			275	284	227	447	202	482
AK 25	211	166	71		120	341	234	516	83	300
AK 28	322	79	88		48	319	219	444	202	323
Neb. 42-1	240	171				290	104	394	100	325
ND8891-3	345	265	172		299	323	226	527	271	500
La. 01-70	309	218	115		186	428	246	494	261	462
La. 11-24	210	165	130		194	270	220	429	248	418
La. 11-118	243	142	123		176	352	188	526	212	501
Red Pontiac	460	266	166		297	448	241	557	281	493
Russet Burbank	212	171	18		160	379	221	518	110	277
Katahdin										
AVERAGE										

North Central Table 3. Percent U.S. No. 1

Variety	Early		Alberta		Manitoba		La.		Kansas		Mich.		Mo.		Minn.		Neb. Late Summer		Neb. Fall		N. Dak.		Ohio		S. Dak.		Wisc.		Ave.	
	%		%		%		%		%		%		%		%		%		%		%		%		%		%		%	
Minn. 4536	78		90		90		64		84		97		98		100		76		82		97		83		97		98		90	
ND8913-4Russ	46		54		54		64		41		89		95		94		52		73		83		74		81		85		72	
ND8751-16	68		71		71		77		45		86		96		96		49		78		88		70		90		91		77	
Norland	75		91		91		71		55		94		97		99		80		89		95		87		95		93		86	
<u>Medium to Late</u>																														
Norchip	74		78		78		82		74		94		97		99		62		73		90		78		95		96		84	
Wisc. 718	87		90		90		84		83		94		98		100		72		83		89		81		97		98		89	
Wisc. 726	86		91		91		84		88		96		98		100		74		75		93		82		96		97		89	
Wisc. 729R	89		90		90		89		84		94		98		99		74		86		86		86		94		96		90	
Minn. 3866	75		78		78				64		83		97		99		59		85		90		83		95		90		83	
Minn. 4858	90		82		82				85		93		97		100		69		79		74		84		94		98		87	
AK 25	76		70		70		50		56		94		96		99		32		61		85		80		93		96		76	
AK 28	71		53		53		79		28		92		96		99		57		74		78		80		92		97		77	
Neb. 42-1	77		74		74						94		92		97		50		61		70		65		95		92		79	
ND8891-3	83		90		90		83		81		94		98		99		60		77		92		85		81		95		86	
La 01-70	87		91		91		83		78		94		96		99		66		90		88		85		94		97		88	
La 11-24	77		83		83		80		71		94		97		99		71		85		85		78		95		93		85	
La 11-118	75		75		75		75		61		91		91		99		54		84		90		74		89		92		81	
Red Pontiac	85		88		88		75		86		96		97		100		70		70		89		90		97		97		88	
Russet Burbank	75		63		63		10		61		93		94		98		50		49		53		58		89		89		68	
Katahdin																							78							

AVERAGE

78

79

72

68

93

96

99

62

77

85

79

93

94

North Central Table 4. Maturity Classification^{1/}

Variety	Early	Med.	Early	Alberta	Manitoba	La.	Kansas	Mich.	Mo.	Minn.	Neb. Late Summer	Neb. Fall	N. Dak.	Ohio	S. Dak.	Wisc.	Ave.
Minn. 4536	2.0			1.1			3.0	2.0	3.0	1.5	2.0		3.0	2.2	3.0	1.0	2.2
ND8913-4Russ	1.0			1.0		1.0	3.0	1.8	3.0	1.0	1.0		2.3	2.0	3.0	1.5	1.8
ND8751-16	2.0			1.9		1.0	4.0	1.0	3.5	3.2	3.0		3.0	2.0	3.0	2.5	2.5
Norland	2.0			1.3		1.0	2.0	1.0	1.5	2.0	1.0		2.0	1.0	2.0	1.0	1.5
<u>Medium to Late</u>																	
Norchip	2.0			2.3		2.0	4.0	1.8	4.0	2.5	4.0		2.8	2.5	4.0	2.0	2.8
Wisc. 718	3.0			3.2		2.0	4.0	3.0	4.5	4.0	4.0		4.0	3.0	4.0	3.5	3.5
Wisc. 726	3.0			3.0		3.0	4.0	2.3	4.0	2.8	4.0		4.0	3.8	4.0	3.0	3.4
Wisc. 729R	3.0			3.8		3.0	5.0	4.3	4.5	4.2	4.0		4.8	3.8	4.5	3.0	4.0
Minn. 3866	3.0			2.0			4.0	2.0	4.0	3.8	3.0		2.8	2.5	4.0	2.5	3.1
Minn. 4858	3.0			2.1			4.0	1.3	4.0	2.0	2.0		2.6	2.0	4.0	2.0	2.6
AK 25	4.0			4.2		3.0	5.0	5.0	4.5	4.8	4.0		4.5	3.8	4.5	4.0	4.3
AK 28	4.0			5.0		3.0	3.0	5.0	3.0	5.0	4.0		5.0	3.8	3.5	4.5	4.1
Neb. 42-1	4.0			3.4				2.5		3.5	4.0		4.3	4.7	4.0	4.0	3.8
ND8891-3	3.0			2.9		2.0	3.0	2.5	3.5	4.0	4.0		3.8	3.0	3.0	3.5	3.2
La 01-70	4.0			3.9		4.0	4.0	3.5	4.0	3.8	5.0		4.0	3.2	4.0	3.0	3.9
La 11-24	3.0			1.8		3.0	4.0	1.8	3.5	1.8	4.0		4.3	3.2	4.0	2.5	3.1
La 11-118	4.0			4.0		3.0	4.5	3.8	4.5	3.8	5.0		5.0	3.6	4.0	3.0	4.0
Red Pontiac	4.0			3.6		4.0	4.0	4.3	3.5	3.5	5.0		4.5	4.0	4.0	3.0	4.0
Russet Burbank	5.0			4.0		5.0	5.0	5.0	5.0	4.0	4.0		4.8	3.6	5.0	4.0	4.5

1/

1. Very Early - Norland maturity
2. Early - Irish Cobbler maturity
3. Medium - Red Pontiac maturity
4. Late - Katahdin maturity
5. Very late - Russet Burbank maturity

2/ No data - vines killed by frost

North Central Table 5. Percent Total Solids.

Variety	Neb.																
Early to Med.	Early	Alberta	Manitoba	La.	Kansas	Mich.	Mo.	Minn.	Summer	Neb. Fall	N. Dak.	Ohio	S. Dak.	Wisc.	Ave.		
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%		
Minn. 4536	19.2	21.2			17.9	17.3	17.3	16.7	18.6	16.7	20.7	16.9	18.9	16.7	18.2		
ND8913-4Russ	21.5	22.5	19.7		19.8	19.9	19.9	18.2	19.4	19.2	23.2	17.5	19.9	17.3	19.8		
ND8751-16	22.1	25.0	20.3		23.1	20.7	19.0	17.5	20.3	20.1	23.5	15.4	21.6	18.6	20.6		
Norland	17.2	19.3	18.2		17.9	17.1	18.0	14.3	19.9	16.7	20.1	13.3	17.6	18.2	17.5		
<u>Medium to Late</u>																	
Norchip	22.7	23.9	19.7		22.9	21.6	20.3	18.8	20.7	19.7	22.6	18.4	21.9	20.5	21.1		
Wisc. 718	21.2	22.4	18.4		20.4	19.0	19.7	17.5	18.8	19.7	19.9	16.5	18.4	18.2	19.2		
Wisc. 726	21.8	23.4	18.4		21.3	21.2	20.5	19.7	18.6	21.2	21.1	17.7	19.9	19.4	20.3		
Wisc. 729R	20.8	24.9	18.0		19.0	20.9	18.8	18.8	19.9	20.3	20.0	18.6	21.8	20.3	20.2		
Minn. 3866	22.0	24.7			21.3	20.3	20.3	18.2	16.9	20.5	23.3	17.3	21.0	19.4	20.4		
Minn. 4858	21.0	22.9			20.6	18.2	19.2	16.5	20.7	18.6	22.8	16.5	18.8	17.1	19.4		
AK 25	24.2	24.0	18.8		20.2	23.7	20.1	20.1	20.9	21.2	20.9	18.6	22.6	21.2	21.6		
AK 28	23.3	23.2	19.4		21.2	21.8	20.1	19.7	20.9	21.2	19.3	17.5	22.2	20.3	20.8		
Neb. 42-1	18.1	21.1				19.0	19.2	17.1	16.9	18.4	19.1	18.4	19.6	19.2	18.7		
ND8891-3	24.5	23.9	16.7		21.8	20.3	18.8	19.7	21.6	20.5	22.7	18.4	22.3	20.9	20.9		
La 01-70	23.2	23.5	20.5		20.4	21.6	19.2	19.0	20.5	19.7	21.3	18.2	21.8	19.7	20.7		
La 11-24	22.1	22.2	18.8		21.0	20.3	18.8	17.1	18.2	19.4	22.6	16.9	20.4	18.2	19.7		
La 11-118	21.8	22.7	18.2		19.6	20.3	18.8	18.2	19.7	19.2	20.6	17.7	21.4	19.7	19.8		
Red Pontiac	21.4	20.2	17.1		17.0	16.9	17.1	16.0	17.1	18.4	19.6	15.4	19.6	18.4	18.0		
Russet Burbank	21.8	21.2	20.3		18.9	20.9	19.7	19.9	19.9	20.3	19.5	19.0	21.3	20.3	20.2		
Katahdin												18.4					
AVERAGE	21.6	22.7	18.8		20.2	20.1	19.2	18.1	19.4	19.5	21.2	17.3	20.5	19.1			

North Central Table 6. Scab Reaction Report^{1/} (Most representative scab - area - type)

Variety	Neb.															
	Early	Med.	Early	Alberta	Manitoba	La.	Kansas	Mich.	Mo.	Minn.	Summer	Fall	N. Dak.	Ohio	S. Dak.	Wisc.
Minn. 4536					1-2		2-2	0-0	None	0-0	3-2	None	T-1		0-0	0-0
ND8913-4Russ					T-1	0-0	3-1	3-1	None	0-0	0-0	None	0-0	T-1	0-0	0-0
ND8751-16	1-1				0-0	0-0	1-1	3-1	None	0-0	0-0	None	T-1		0-0	0-0
Norland					T-1	1-1	2-1	0-0	None	1-1	0-0	None	2-1		0-0	0-0
<u>Medium to Late</u>																
Norchip	2-3				T-1	1-2	2-1	1-1	None	0-0	0-0	None	T-1	1-2	1-2	0-0
Wisc. 718	1-2				1-1	1-3	1-1	0-0	None	0-0	0-0	None	1-1	2-2	2-2	0-0
Wisc. 726	1-1				1-3	4-2	2-1	2-2	None	0-0	0-0	None	T-1	2-3	2-2	0-0
Wisc. 729R	1-2				T-1	1-1	1-1	0-0	None	1-1	0-0	None	T-1	3-3	2-2	0-0
Minn. 3866	1-3				1-2		3-1	2-1	None	0-0	3-1	None	T-1	T-2	1-2	0-0
Minn. 4858	1-2				T-1		1-1	0-0	None	0-0	3-1	None	T-1		1-2	0-0
AK 25					1-2	1-1	3-1	1-1	None	0-0	2-1	None	2-2		0-0	0-0
AK 28	1-2				1-2	1-2	3-1	2-2	None	0-0	2-1	None	2-2	2-1	0-0	0-0
Neb. 42-1					T-1			0-0	None	2-2	0-0	None	T-1	T-1	0-0	0-0
ND8891-3					1-3	1-3	1-3	0-0	None	0-0	0-0	None	T-1		0-0	0-0
La. 01-70	3-3				1-3	1-3	3-1	3-2	None	2-5	0-0	None	1-2	2-3	0-0	3-5
La. 11-24	1-2				1-3	1-1	4-1	1-1	None	1-1	0-0	None	2-2		0-0	0-0
La. 11-118	1-2				1-2	1-1	3-2	1-2	None	0-0	0-0	None	3-1	T-1	3-4	0-0
Red Pontiac					1-2	1-1	4-1	1-2	None	0-0	0-0	None	1-1		1-2	0-0
Russet Burbank					T-1	1-4	1-1	1-3	None	0-0	0-0	None	T-1		0-0	0-0
Katahdin																

1/ Area	Type
T-Less than 1%	1. small, superficial
1-1-20%	2. larger, superficial
2-21-40%	3. larger, rough pustules
3-41-60%	4. larger pustules, shallow holes
4-61-80%	5. very large pustules, deep holes
5-81-100%	

North Central Table 7. Summary of Grade Defects.

Variety	External						Internal				
	Early to Med.	Early	Scab	Growth		Sun Green	Total 1/ Free of Ext. Defects	Hollow Heart	Internal Necrosis	Vascular Discolor- ation	Total 1/ Free of Int. Def.
				Cracks	Second Growth						
Early to Med.											
Minn. 4536			2.3	2.5	2.0	1.4	92	0.0	1.1	3.3	96
ND8913-4Russ			3.4	2.8	3.6	1.6	89	1.3	0.2	5.3	93
ND8751-16			1.5	1.3	4.0	3.2	90	0.1	0.1	1.0	99
Norland			2.9	4.8	2.3	1.2	92	0.5	0.3	4.7	95
Medium to Late											
Norchip			1.6	2.3	6.5	3.3	87	0.3	2.7	4.7	93
Wisc. 718			5.3	1.3	1.8	6.1	86	3.4*	1.6	4.9	90
Wisc. 726			6.9	0.5	3.1	3.3	85	0.8	1.6	5.7	92
Wisc. 729R			1.9	1.0	1.7	2.6	93	0.3	0.1	5.8	94
Minn. 3866			3.5	2.0	1.3	1.8	91	0.4	0.3	1.3	98
Minn. 4858			1.3	2.1	1.1	2.5	93	0.4	1.9	5.0	92
AK 25			4.2	1.4	12.3*	1.4	81	0.1	0.1	7.0	93
AK 28			8.9	0.0	8.0	1.0	83	0.6	1.0	2.1	96
Neb. 42-1			5.5	1.0	9.2	1.9	83	1.3	0.9	7.7	90
ND8891-3			3.9	1.8	3.6	3.3	88	1.8	1.3	2.2	95
La. 01-70			15.8*	0.2	3.3	1.5	79	1.4	0.3	3.7	95
La. 11-24			10.8	1.2	1.5	3.4	83	1.8	0.2	0.6	98
La. 11-118			11.8	2.2	2.1	6.2	78	0.7	0.1	4.3	95
Red Pontiac			4.9	0.9	7.2	1.3	86	0.1	0.8	7.3	91
Russet Burbank			1.3	4.1	29.3*	2.3	63	0.1	0.9	3.7	95

1/ Percent normal tubers showing no defects (some individual tubers had more than one type of defect.

* Possible weakness of a variety or clone.

North Central Table 8. Chip Quality.

Variety	Early	Alberta	Manitoba	La.	Kansas	Mich	Mo.	Minn.	Neb. Late Summer	Neb. Fall	N. Dak.	2/	Ohio	1/	S. Dak.	3/	Wisc.	1/
Minn. 4536	8.1		32			7		10.0	5	4	35		6.95				8.0	
ND8913-4Russ	6.8		42	4.8		7		8.0	5	4	33		6.12				8.0	
ND8751-16	3.9		43	3.8		3		3.5	4	3	45		6.07				5.0	
Norland	6.5		54	3.3		4		7.0	4	4	42		5.45				7.0	
Medium to Late																		
Norchip	2.2		55	2.8		3		6.0	3	3	45		3.70				4.2	
Wisc. 718	3.5		61	2.0		2		5.0	3	3	45		4.75				4.5	
Wisc. 726	4.8		61	3.2		2		6.0	3	3	37		3.55				3.8	
Wisc. 729R	7.2		46	3.3		7		9.0	4	4	31		6.87				7.0	
Minn. 3866	7.5		41			6		10.0	4	4	29		4.70				7.0	
Minn. 4858	4.5		39			4		10.0	5	4	32		7.37				9.0	
AK 25	3.5		44	5.7		6		7.0	4	4	35		6.15				5.5	
AK 28	7.0		51	3.5		3		6.5	3	4	42		4.77				3.7	
Neb. 42-1	8.9		36			7		9.5	3	5	21		6.50				8.0	
ND8891-3	3.8		55	3.3		4		8.5	3	3	44		3.87				5.0	
La. 01-70	6.0		47	2.0		2		5.0	3	4	35		4.70				5.0	
La. 11-24	4.1		45	3.3		2		5.5	3	3	43		4.50				5.8	
La. 11-118	5.8		42	1.2		4		6.5	5	4	39		5.00				5.2	
Red Pontiac	7.4		20	5.7		7		9.5	3	4	28		8.05				9.0	
Russet Burbank	6.0		30	5.7		6		6.5	4	4	32		5.57				5.7	

1/ PCII Color Chart - low numbers indicate light chips

2/ Agtron - high numbers indicate light chips

3/ No results

North Central Table 9. Merit Ratings-^{1/}

Variety	Early to Med.	Early	Alberta	Manitoba	La.	Kansas	Mich.	Mo.	Minn.	Neb. Late Summer	Neb. Fall	N.Dak.	Ohio	S.Dak.	Wisc.	Total Points
Minn. 4536						4	5	2	3					1	4	19
ND8913-4Russ																0
ND8751-16							2									2
Norland			1									5				6
<u>Medium to Late</u>																
Norchip			3					4				3	3			13
Wisc. 718						3	4	5		4	4			2	3	25
Wisc. 726	2								2	3			1		1	11
Wisc. 729R	1		4		2	2	3	3		5		1			5	26
Minn. 3866								1			1					2
Minn. 4858	5											2				7
AK 25									4				4		2	10
AK 28																0
Neb. 42-1																4
ND8891-3	4			5			1		5	2	5	4	5	3	5	45
La. 01-70													2			2
La. 11-24											3					6
La. 11-118									1		2					7
Red Pontiac			3							1						10
Russet Burbank						1								4		0

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1/ Merit Ratings

Rating	Points
1	5
2	4
3	3
4	2
5	1

WISCONSIN

R. E. Hanneman, Jr.

Genetics and Cytogenetics of the Tuber-Bearing Solanum Species
(Cooperative ARS, USDA and Wisconsin Station)

Haploid Extraction in Solanum tuberosum Group Andigena. Sixty-six different Gp. Andigena introductions were selected because of their desirable characteristics. Twenty clones of each were grown and were crossed with Group Phureja clone 1.22. All progeny were grown out from these crosses and were screened for haploids. Chromosome counts were made on the root-tips of the suspected haploid seedlings.

The overall frequency of haploids was found to be 13 haploids per 100 fruit with a high of 106 haploids per 100 fruit. The frequency of haploids, triploids and tetraploids was determined by counting the chromosomes of all the progeny from several crosses. Some produced primarily haploid, others primarily triploid, and still others, primarily tetraploid progeny. The average seed per fruit was very low - 1.4 seeds per fruit.

The crossing data suggest a constancy of behavior pertaining to ploidy level of progeny from particular accessions. That is, if a clone threw primarily haploids consistently in a cross, then it is quite likely that its sibs would also throw higher frequencies of haploids. The same statement could be made for triploids and tetraploids as well. This suggests that the genetic mechanism governing their formation is not complicated and is certainly not due to chance occurrence.

Haploid Extraction in the Cultivar "Russet Burbank". In 1975, 1,423 pollinations were made between Russet Burbank and Solanum tuberosum Gp Phureja clone 1.22. This resulted in 606 fruit and 246 seeds. The progeny were grown out and chromosome counts were made on all seedlings. One hundred and fifty progeny were counted resulting in the identification of six haploids, 143 triploids and one tetraploid. The six haploids of "Russet Burbank" are thrifty with the exception of one clone. The high frequency of triploids is more typical of Gp. Andigena than Gp. Tuberosum clones, perhaps saying something about the origin of "Russet Burbank" or its unknown male parent.

Interspecific Cross Incompatibility (Cooperating with P.D. Ascher, Dept. of Horticulture, Univ. Minnesota, St. Paul). A large number of interspecific crosses have been made where unilateral cross incompatibility is known to occur. In some cases, pollen failed to germinate; in others there appeared to be stylar inhibition, and in still others pollen tubes apparently grew sufficiently suggesting failure of fertilization or embryo or endosperm breakdown. Efforts are aimed at identifying where failure to set seed occurs and then to find ways to overcome it.

ALABAMA

J. L. Turner and Harrison Bryce - Main Station
J. E. Barrett, R. N. McDaniel, Frank B. Selman and
Frank E. Garrett (Retired) - Gulf Coast Substation
Marlin H. Hollingsworth - North Alabama Horticulture Substation
John Eason and Marvin E. Ruf - Sand Mountain Substation

Irish Potato Variety Trials, Gulf Coast Substation,
Fairhope and Sand Mountain Substation
Crossville, Alabama

Experimental Procedure. Seed potatoes were obtained from Frito-Lay Company Baldwin County Alabama, South Dakota, North Dakota, Starks Farms, USDA and the University of Wisconsin for 1976 trials. Fourteen named varieties and 16 numbered selections were grown this year for yield trials. Each entry was replicated 4 times in a randomized block design. Plots were 20 feet by 38 and 44 inches at Fairhope and Crossville respectively. Seed pieces were cut to approximately 1½ ounces each and dipped for 1 minute in a solution containing 1 pound of 60 percent wettable Mertect in 50 gallons of water, dried, calloused, and presprouted at 55°F. for approximately 2 weeks and planted February 17 at Fairhope and March 2 at Crossville. Seed pieces were spaced 12 inches in the drill. Plots were harvested May 26 at Fairhope and June 29 at Crossville.

Results. Atlantic (B6987-56) was the highest yielding variety again this year in the Baldwin County trial. Atlantic also produced the highest specific gravity. Red La Soda from Johnson, North Dakota and Starks Farms were the highest yielding red entries. FL 162 was the highest yielding variety from Frito-Lay and W726 was the highest yielding entry from the University of Wisconsin. Quite a variation in yield was noted this year within the same variety from different seed sources. Particularly outstanding were the wide variations that resulted within Red La Soda and Superior. B7679-9 and B7608-2 had an attractive dark brown russet skin with fair yields and specific gravity.

At Crossville, Red La Soda from Johnson, North Dakota was the highest yield entry. Atlantic (B6987-56) was the highest yielding white entry from the USDA and also had the highest specific gravity. FL-795 and FL-750 were the highest yielding varieties from Frito-Lay and W715 was the highest yielding entry from the University of Wisconsin. Specific gravity was very good for almost all the varieties. B6969-2 and Red La Soda from South Dakota were the only two varieties below .08 gravity. Variations in yields from the different seed sources were similar to those in the Baldwin County trial. Overall yields were lowest at Crossville. B7679-9 and B7608-2 were very low yielding.

Alabama Table 1. Potato Variety Trial, Fairhope, 1976^{1/}

Variety	Source	Marketable yield/		Specific gravity	Stand at harvest	Eye depth	Eye size	Skin color	Shape	Eye appeal	Harvest season	
		acre										
		Total	Size									
		A ² /	B									
		cwt.	cwt.	pct.								
Atlantic(B6987-56)	USDA	294	280	14	1.085	93	M	S	Wh-SR	R-Flat	4.5	L
Red La Soda	Johnson, North Dakota	288	277	11	.067	100	D	L	Red	Round	4.0	M
Red La Soda	Starks Farms	285	273	12	.065	97	D	L	Red	Round	4.0	M
B7802-2	USDA	265	252	13	.075	91	M	S	Clear	R-Flat	3.0	M
FL-162	Frito-Lay	264	247	17	.073	99	S	S	Wh-SR	Round	4.5	L
Red La Soda	Tibert, North Dakota	261	250	11	.065	99	D	L	Red	Round	4.0	M
La Rouge	USDA	258	233	25	.069	98	M	M	Red	Round	3.5	M
Wisconsin 726	U. Wisconsin	257	247	10	.077	98	S	S	Wh	R-Long	4.0	L
B6987-29	USDA	256	246	10	.074	92	M	S	Wh-SR	R-Flat	4.0	L
FL-657	Frito-Lay	244	232	12	.071	89	D	S	Wh	Round	3.5	L
La Chipper	USDA	244	222	22	.073	94	M	M	Wh	Round	3.5	M
FL-750	Frito-Lay	243	217	26	.078	91	M	S	Wh	Round	3.5	L
FL-795	Frito-Lay	238	231	7	.078	92	S	S	Wh	R-Flat	4.0	L
Wisconsin 718	U. Wisconsin	238	219	19	.074	100	S	S	Wh	Round	4.0	M-L
Wisconsin 715	U. Wisconsin	235	210	25	.074	91	S	S	Wh	R-Long	3.5	M-L
Wisconsin 623	U. Wisconsin	232	198	34	.077	91	S	S	Wh	Round	3.5	M
B8101-3	USDA	229	205	24	.069	93	M	M	Wh-SR	Round	4.0	L
Norchip	Starks Farms	221	201	20	.078	96	M	M	Wh	Round	3.0	L
B7595-3	USDA	221	191	30	.075	96	M	M	Pink	Round	3.0	M
La Chipper	Starks Farms	217	198	19	.074	89	M	M	Wh	Round	3.5	M
Superior	Starks Farms	210	195	15	.077	91	S	S	Wh-SR	Round	4.5	M
Wisconsin 732R	U. Wisconsin	210	194	15	.067	94	M	S	Deep-Red	Round	3.0	M
Norchip	USDA	205	182	23	.078	96	S	M	Wh	Round	3.5	L
Wisconsin 737	U. Wisconsin	203	154	49	.073	100	S	S	Wh-SR	Round	4.0	E
Red La Soda	Larkin, South Dakota	201	187	14	.065	92	D	L	Red	Round	4.0	M
Seminole	Frito-Lay	200	184	16	.082	99	S	S	Wh	Round	3.5	E
B7768-4	USDA	197	189	8	.078	94	M	S	Wh-SR	Round	4.0	M
FL-723	Frito-Lay	186	176	10	.069	93	D	L	Clear	R-Flat	3.5	E

continued on next page

Alabama Table 1. Continued.

Variety	Source	Marketable yield/		Specific Stand at harvest	Eye depth	Eye size	Skin color	Shape	Eye appeal	Harvest season
		acre								
		Total	Size							
		Size	2/ A- B							
cwt.				cwt.	cwt.	pct.				
Wischip	U. Wisconsin	185	145	40	.072	S	Wh-SR	Round	4.0	M
Wisconsin 721	U. Wisconsin	183	164	19	.074	S	Wh	Round	3.5	M
B6969-2	USDA	172	160	12	.068	M	Wh-SR	Round	4.5	E
B7608-2	USDA	169	132	37	.067	M	Russet	Round	4.5	E
Superior	USDA	167	148	19	.076	M	Wh	R-Flat	3.5	M
B7679-9	USDA	149	137	12	.074	M	Russet	R-Long	4.5	M

1/ Soil test p = 130 (H); k = 80 (H); Mg = 250 (H); pH = 5.6.

2/ Size A = potatoes with 1 7/8 inches diameter and larger. Size B = potatoes with 1 1/2 to 1 7/8 inches diameter.

3/ S = shallow; M = medium; D = deep.

4/ S = small; M = medium; L = large.

5/ Wh = white; SR = some russet.

6/ 5 = excellent; 4 = good; 3 = fair; 2 = poor; 1 = very poor.

7/ E = 90; M = 95; L = 100 days from planting to harvest.

Alabama Table 2. Potato Variety Trial, Crossville, 1976^{1/}

Variety	Source	Marketable yield/acre				Specific gravity	Stand at harvest
		Total	Size A ^{2/}	Size B			
		Cwt.	Cwt.	Cwt.		Pct.	
Red La Soda	Johnson, North Dakota	247	230	17	1.083	95	
Red La Soda	Starks Farms	203	183	20	.082	95	
La Rouge	USDA	201	180	21	.081	100	
FL-795	Frito-Lay	199	189	10	.090	90	
FL-750	Frito-Lay	199	181	18	.089	95	
Red La Soda	Tibert, North Dakota	199	172	9	.082	90	
Wisconsin 715	U. Wisconsin	197	177	20	.088	95	
Kennebec	USDA	185	167	18	.085	95	
Wisconsin 623	U. Wisconsin	179	152	27	.088	95	
Atlantic (B6987-56)	USDA	176	163	13	.097	95	
B8101-3	USDA	176	157	19	.082	90	
Wisconsin 726	U. Wisconsin	169	157	12	.090	100	
B6987-29	USDA	168	160	8	.092	95	
FL-162	Frito-Lay	158	145	13	.092	95	
Norchip	Starks Farms	155	137	18	.094	100	
FL-657	Frito-Lay	153	140	13	.085	90	
Wisconsin 732R	U. Wisconsin	153	126	27	.081	95	
Superior	Starks Farms	152	137	15	.087	95	
B7768-4	USDA	150	141	6	.082	90	
B7802-2	USDA	147	147	6	.082	90	
La Chipper	USDA	146	130	16	.084	95	
Superior	USDA	144	137	7	.083	100	
Wisconsin 718	U. Wisconsin	142	129	13	.082	75	
Norchip	USDA	138	125	13	.092	95	
La Chipper	Starks Farms	128	114	14	.081	85	
B7595-3	USDA	126	105	21	.081	95	
FL-723	Frito-Lay	124	117	7	.082	95	
Wisconsin 737	U. Wisconsin	121	98	23	.090	100	
Wischip	U. Wisconsin	119	88	31	.081	100	
B6969-2	USDA	103	94	9	.076	80	
Seminole	Frito-Lay	96	89	7	.093	95	

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Alabama Table 2. Continued.

Variety	Source	Marketable yield/acre			Specific gravity	Stand at harvest
		Total	Size A ^{2/}	Size B		
Wisconsin 721	U. Wisconsin	Cwt. 96	Cwt. 77	Cwt. 19	.090	Pct. 95
Red La Soda	Larkin, South Dakota	93	82	11	.073	90
B7679-9	USDA	86	66	20	.080	85
B7608-2	USDA	76	45	31	.082	95

1/ Soil test p = 105 (H); k = 170 (M); mg = 26 (L); pH = 5.6.

2/ Size A = potatoes with 1 7/8 inches diameter and larger. Size B = potatoes with 1 1/2 - 1 7/8 inches diameter.

CALIFORNIA - 1976

R. E. VOSS & D. E. HALSETH

In 1976, first year seedlings were grown and selected at two locations, 5-12 hill observational plots were grown at three locations, replicated yield trials were grown at 11 locations, and a growth rate-spacing study was grown at four locations.

Approximately 20,000 second and third size tubers of first year greenhouse grown seedlings were obtained from Idaho (J. Pavsek) and North Dakota (R. Johansen), 10,000 from each location. These represented 124 families from Idaho and 61 families from North Dakota. In contrast to 1975, when all seedlings were grown at one central location for secondary selections in the south and in the north, in 1976, one half of each family was grown in Kern County at Shafter and the other half in the north, in Butte Valley of Siskiyou County. Of the 124 families from Idaho, 305 selections from 77 families were made at one or both locations; 218 of these selections (71 percent) were from 39 families that had at least one selection at both sites, 82 selections (27 percent) were from 33 families that had selections made only at Butte Valley, and 5 selections (2 percent) were from families that had selections made only at Shafter. Of the 61 families from North Dakota, 265 selections from 55 families were made at one or both locations; 215 of these selections (81 percent) were from 34 families that had at least one selection at both sites, 30 selections (11 percent) were from 12 families that had selections made only at Butte Valley, and 20 selections (8 percent) were from families that had selections made only at Shafter. Thus, a total of 433 selections, representing 132 families, were made from the 20,000 tubers planted, which represented 185 families. This is a 2.2 percent selection rate on seedlings, and 71 percent selection rate on families.

Of the 430 seedlings selected in 1975, 40 were selected in 1976 for further testing in Kern County, and 43 were selected for further testing in northern California. Of these 83, only 5 were selected at both locations. This fact strongly suggests that selecting will be required at both locations at a very early stage of the program.

The new varieties that performed well in 1976 were Centennial (WC285-146), Bison, Atlantic, and Nooksack. Centennial has performed well in only Kern County. In other areas, one or more problems (hollow heart, coarse skin, susceptibility to speckle leaf, verticillium wilt, metribuzin herbicide, medium yield potential) has prevented it from being a top contender. Bison is more attractively colored and has shallower eyes than Red La Soda or Chieftan; but it consistently yields much less, thus its future is shaky. Atlantic continues to perform well in our trials; commercial scale evaluation is needed. Nooksack performs well in northern California on the sandy soils but its long dormancy and low tuber set prevents it from performing well elsewhere.

The advanced selections that performed best in 1976 were WC316-1, BC8370-4, A68678-1, and A503-42. Others that looked good, at least in some locations, were A66122-3, WN330-1, WC285-141, WC285-18, WN352-1, and ND8891-3.

CALIFORNIA TABLE 1. YIELD AND QUALITY MEASUREMENTS AT SHAFTER, 1976

Variety	Source	Total	Yield, cwt/A			No. 1's	Culls	2's & %	No. 1's	Spec. Grav. 1.0--	Vine Rating 1/	Tuber Rating 2/	Sugar Rating 3/	Maturity
			No. 1's											
			>12 oz	4-12 oz	<4 oz									
PART A. RUSSETS														
A68678-1	Ida	610	140	375	15	80	84	88	4.2	3.0	0.6	EM		
A66122-3	Ida	580	75	450	10	45	91	91	5.0	3.0	0.4	M		
WC415-12	Colo	525	45	410	25	45	87	90	4.2	2.0	0.8	M		
A70365-21	Ida	500	75	325	20	80	80	74	5.0	2.0	0.5	EM		
WC415-14	Colo	495	50	395	10	40	90	84	5.0	3.0	0.8	M		
WC285-18	Delta	475	30	385	20	40	87	82	4.0	3.0	0.9	M		
Nampa	Delta	470	5	410	20	35	88	93	3.2	2.0	0.7	ML		
Russet Burbank	Delta	470	0	310	15	145	66	94	4.0	1.0	0.5	L		
BC8370-1	Colo	455	150	270	5	30	92	77	5.0	2.0	0.7	EM		
WC435-3	Colo	440	10	350	35	45	82	84	4.2	2.0	0.9	ML		
ND7641-3	Delta	435	5	395	15	20	92	87	3.0	3.0	0.7	M		
WC415-1	Colo	425	35	320	15	55	84	89	4.0	2.0	1.0	M		
WC285-83	Colo	420	60	310	20	30	88	89	5.0	2.8	0.7	EM		
WN328-2	Ida	420	45	305	15	55	83	88	4.0	3.0	1.2	M		
Targhee	Delta	415	30	335	20	30	88	91	4.0	3.0	0.6	M		
WC316-1	Delta	405	45	315	10	35	89	81	3.0	4.0	0.8	M		
BC8370-4	Colo	400	0	345	35	20	86	92	5.0	5.0	0.8	M		
ND9434-1	ND	390	20	295	25	50	81	77	5.0	3.0	0.9	ML		
Norgold Russet	Delta	385	10	325	30	20	87	81	4.0	3.8	1.0	E		
ND8913-4	ND	385	15	285	30	55	78	83	4.2	3.0	1.4	M		
Centennial	Delta	365	45	275	25	20	88	82	4.0	4.0	1.0	M		
WN330-1	Ida	365	5	315	20	25	88	86	4.2	4.0	0.7	ML		
WC285-141	Delta	355	5	295	40	15	85	84	4.0	4.0	0.4	ML		
Nooksack	Delta	335	40	265	10	20	91	95	2.0	4.0	0.6	ML		
WC314-2	Delta	330	15	265	30	20	85	91	4.0	3.8	0.8	M		
ND8914-5	ND	310	10	240	20	40	81	74	4.2	3.0	2.9	M		
WC373-6	Colo	300	15	250	25	10	88	86	1.0	3.0	0.9	M		
ND9358-3	ND	250	0	275	30	45	70	74	4.0	3.0	1.1	ML		
PART B. WHITES														
ND8891-3	ND	715	95	495	10	115	83	78	5.0	2.0	1.0	EM		
ND8888-1	ND	680	95	490	10	85	86	81	5.0	2.8	0.4	EM		

CALIFORNIA TABLE 1. YIELD AND QUALITY MEASUREMENTS AT SHAFTER, 1976

Variety	Source	Total	Yield, cwt/A			No. 1's	Culls	2's & %	No. 1's	Spec. Grav. 1.0--	Vine Rating 1/	Tuber Rating 2/	Sugar Rating 3/	Maturity
			>12 oz	4-12 oz	<4 oz									
PART B. WHITES														
A503-42	Delta	605	65	265	15	260	55		89	4.2	2.0	0.6		M
White Rose	BV	605	70	365	15	155	72		75	5.0	2.0	0.8		EM
Atlantic	BM	560	60	450	10	40	91		98	5.0	4.0	0.5		M
B7151-4	BM	555	10	465	20	60	86		98	5.0	3.2	0.5		M
ND8750-20	ND	530	30	420	5	75	85		75	5.0	2.8	1.0		EM
B6987-29	BM	520	45	350	5	120	76		93	5.0	2.0	0.5		M
WN352-1	D	520	35	445	10	30	92		99	5.0	4.0	0.7		M
ND8888-2	ND	460	40	330	10	80	80		79	4.0	2.8	0.6		M
ND9124-4	ND	440	15	395	10	20	93		81	4.2	4.0	0.5		M
PART C. REDS														
Red La Soda	D	690	135	465	10	80	87		77	5.0	3.0	0.5		E
Chieftain	D	435	35	375	10	15	94		77	3.0	4.0	0.5		M
Bison	ND	385	15	340	10	20	92		75	4.0	5.0	0.4		E

1/ Vine Ratings: 5= Excellent, 4= Very Good, 3= Good, 2= Fair, 1= Poor.

2/ Tuber Ratings: 5= Excellent, 4= Good, 3= Questionable, 2= Unacceptable, 1= Poor.

3/ Sugar Ratings: 0= None, 1= Approx 1/10 %, 2= Approx. 1/4 %, 3= Approx. 1/2 %, 4= 2% or more.
In most California locations, a rating of approx. 1.2 corresponds to 6 on NPCI Color Chart for Chips.

CALIFORNIA TABLE 2. YIELD AND QUALITY MEASUREMENTS AT TULELAKE, 1976

Variety	Source	Yield, cwt/A				No. 1's Culls	2's & No. 1's	%	Spec. Grav. 1.0--	Vine Rating 1/	Tuber Rating 2/	Sugar Rating 3/	Maturity
		Total	No. 1's		<4 oz								
			>12 oz	4-12 oz									
PART A. RUSSETS													
A70365-21	Ida	590	280	215	35	60	84	68	5.0	1.0	0.4	E	
A66107-51	D2	485	175	240	20	50	86	65	5.0	2.8	1.0	EM	
A66122-3	Ida	450	90	265	60	35	79	71	5.0	3.2	0.4	M	
Russet Burbank	D1	450	40	300	90	20	76	78	5.0	3.0	0.7	M	
A68678-1	Ida	430	140	215	35	40	83	80	4.0	4.0	0.4	EM	
BC8370-4	Colo	430	60	280	65	25	79	85	4.0	3.0	0.4	M	
WN330-1	Ida	420	105	265	45	5	88	71	4.0	4.2	0.8	M	
A66122-3	D3	415	65	270	50	30	81	70	5.0	3.0	0.7	M	
Norgold Russet	D2	385	75	260	30	20	87	73	3.0	2.8	1.2	E	
WC285-141	D2	375	100	240	25	10	91	80	5.2	4.2	0.5	M	
Russet Burbank	Ida	375	50	210	80	35	69	82	4.0	3.0	0.8	M	
WC316-1	D2	365	115	220	20	10	92	73	5.0	5.0	0.8	M	
BC8370-1	Colo	355	80	90	15	170	48	82	4.0	1.0	0.7	EM	
WC316-1	Colo	350	115	200	25	10	90	71	5.0	4.0	0.7	M	
ND9358-3	ND	350	50	165	55	80	61	74	3.0	2.0	0.4	EM	
Centennial	D1	325	85	195	25	20	86	71	3.0	2.0	0.8	M	
Nooksack	D4	315	140	140	10	25	89	74	5.0	4.0	0.2	ML	
Nampa	D2	315	20	200	50	45	70	69	5.2	3.0	0.8	ML	
ND7641-3	D	305	40	225	30	10	87	70	3.0	4.0	0.5	M	
ND9434-1	ND	305	45	185	65	10	75	72	3.0	4.2	0.3	EM	
WN328-2	Ida	290	70	175	35	10	84	76	5.0	3.8	0.5	M	
Targhee	D2	285	75	160	35	15	82	68	5.0	3.2	0.9	EM	
WC435-3	Colo	260	40	135	70	15	67	68	5.2	2.0	0.6	M	
Nooksack	D3	255	90	145	20	0	92	74	5.0	5.0	0.5	ML	
WC285-83	Colo	250	60	150	30	10	84	85	4.0	2.8	0.4	EM	
Targhee	Ida	240	45	150	20	25	81	67	4.0	3.8	0.4	M	
WC285-18	Colo	230	45	140	20	25	80	69	4.0	2.0	0.8	M	
WC373-6	Colo	225	90	105	20	10	87	71	4.0	3.8	1.6	EM	
WC415-14	Colo	215	45	105	55	10	70	71	5.0	2.8	0.9	M	
WC314-2	D	190	30	120	40	0	79	81	-	3.0	0.4	L	
WC415-12	Colo	185	40	95	30	20	73	73	5.2	3.0	0.6	M	
WC415-1	Colo	140	5	70	45	20	54	68	4.0	3.0	1.6	M	

CALIFORNIA TABLE 2. YIELD AND QUALITY MEASUREMENTS AT TULELAKE, 1976

Variety	Source	Total	Yield, cwt/A				<4 oz	2's &		%	Spce. Grav. 1.0--	Vine Rating 1/	Tuber Rating 2/	Sugar Rating 3/	Maturity
			No. 1's		Culls	No. 1's									
			>12 oz	4-12 oz											
PART B. WHITES															
ND8891-3	ND	580	150	370	25	35	90	70	5.0	3.0	0.7	E			
A503-42	D3	565	105	420	25	15	93	82	5.0	3.0	1.2	EM			
A503-42	D1	555	140	370	25	20	92	81	5.2	2.8	1.3	EM			
ND8888-1	ND	550	100	335	35	80	79	65	5.0	2.2	0.3	E			
A503-42	D2	530	135	340	30	25	90	80	4.0	3.0	0.8	EM			
A503-42	D4	525	130	360	20	15	93	81	5.2	3.0	1.1	EM			
ND8888-2	ND	510	55	300	35	120	70	65	5.0	1.0	0.5	E			
B6987-29	BM	500	50	420	20	10	94	86	5.0	3.2	0.6	EM			
Atlantic	BM	475	15	400	55	5	87	88	5.2	4.0	0.5	M			
Kennebec	D3	475	190	210	20	55	84	68	4.0	3.2	0.7	E			
White Rose	D1	450	170	110	25	145	62	62	5.0	1.0	1.0	E			
ND9124-4	ND	445	40	375	30	0	93	72	5.0	4.2	0.6	M			
ND8750-20	ND	405	50	305	25	25	88	63	3.0	3.0	0.3	M			
B7151-4	BM	400	30	325	30	15	89	85	5.2	4.0	0.3	M			
WN352-1	D1	295	15	230	40	10	83	84	3.0	4.0	0.5	ML			
PART C. REDS															
Chieftain	D1	565	65	465	30	5	94	69	4.0	4.0	0.8	EM			
Red La Soda	D2	450	90	300	25	35	87	67	5.0	2.0	0.7	E			
Bison	ND	425	50	320	35	20	87	64	4.0	4.0	0.6	E			

CALIFORNIA TABLE 3. OBSERVATIONAL CLONES SELECTED FOR FUTURE EVALUATION

PART A. RUSSETS											
Clones	Shafter	Tule- Lake	Butte Valley	Clones	Shafter	Tule- Lake	Butte Valley	Clones	Shafter	Tule- Lake	Butte Valley
A69173-2		X		ND9526-4				ND170-2	X		
A69827-10	X			ND9551-4	X		X	ND176-4	X		
A70270-3	X			ND9642-3	X			ND176-5	X		
A70365-15	X			ND9687-2	X			ND176-6	X		X
A70365-17	X	X		ND9713-2	X			WD573-4			
A70365-21		X		ND9721-4	X			WD618-3			X
A70369-2		X		ND9727-2	X		X	WD618-6			X
				ND9727-4	X			WD618-8	X		
A70383-12		X		ND9732-3		X		WD618-9	X	X	
A70383-26		X		ND9732-5	X			WD627-2		X	
A72601-2	X			ND9784-11	X			WD627-3		X	
A72602-5	X			ND9795-8	X			WD627-6	X		
A72633-4	X			NDA8451-3	X			WD630-2	X		
AD7267-1	X			NDA8694-3		X		WD630-4	X		
AD7267-3		X		NDA9145-1		X		WD631-2	X		
AD7319-1			X	ND11-2	X	X		WD631-12		X	
AD7319-2			X	ND27-1	X			WD634-4	X		
AD7320-2			X	ND33-2	X			WD641-1			X
AD7354-2			X	ND47-1	X		X	WD641-4			X
AD7360-4			X	ND51-2	X			WD641-8			X
AD7377-1	X			ND52-2			X	WD641-10			X
AD7377-7			X	ND81-4	X			WD670-5	X		
AD72320-4	X			ND84-1		X		WD683-11			X
AD72421-1			X	ND84-3	X		X	WD694-1	X		
AD72421-2			X	ND85-1	X			WD701-6	X		
AD73109-2			X	ND85-5	X		X	WD701-10			X
AD73175-5			X	ND106-2	X			WD701-16	X		
AD73175-6			X	ND134-1	X			WD706-1			X
AD73200-1		X		ND137-1	X			WD706-2	X		
AD73296-1			X	ND143-1	X			WD708-3			X
AD73365-1	X			ND143-2	X	X	X	WD709-2		X	X
AD73398-1				ND147-4	X			WD709-4			X
AD73414-1	X			ND162-2							
ND9157-10			X	ND162-6	X						
ND9463-2	X			ND166-5							

CALIFORNIA TABLE 3. OBSERVATIONAL CLONES SELECTED FOR FUTURE EVALUATION cont.

PART B. WHITES

<u>Clones</u>	<u>Shafter</u>	<u>Tule- Lake</u>	<u>Butte Valley</u>	<u>Clones</u>	<u>Shafter</u>	<u>Tule- Lake</u>	<u>Butte Valley</u>	<u>Clones</u>	<u>Shafter</u>	<u>Tule- Lake</u>	<u>Butte Valley</u>
A67401-1	X	X		ND8742-2	X			ND9620-1	X		
A70369-2		X		ND9333-2	X			WD670-6		X	
AD7386-1	X			ND9420-11	X			WD679-7	X		
AD72665-1	X			ND9474-6	X			WD683-4	X		
AD73110-1	X			ND9524-5	X						

PART C. REDS

ND9403-16	X			ND9403-19		X		ND9403-21		X	
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CALIFORNIA TABLE 4. SUMMARY OF NO. 1 YIELDS (cwt/A) OF ENTIRES IN 1976 YIELD TRIALS

Part A. Russet Trials

Variety	Kern #5	Kern #8	Shafter	Riverside	Santa Maria	Butte Valley	Tulelake	Salinas Valley	Average	Deviation From Adj. Overall Ave.
A66107-51				260	435	390	415		375	+110
A66122-3	170	405	525	110	375	360	345		325	+ 30
A68678-1	205	370	515	165	395		355		335	+ 45
BC8370-1			420				170		295	- 10
BC8370-4			345				340		340	+ 40
WC285-18	320	430	415	180	360	255	185	340	310	+ 25
WC285-83		475	370	140	320	250	210	165	275	- 15
WC285-141	205	395	300	135	320	350	340	255	290	+ 5
WC314-2	245	335	280				150		250	- 60
WC316-1	180	385	360	190	285	400	325	175	290	+ 5
WC373-6			265			395	195		285	- 25
WC415-1			355			230	75		220	- 90
WC415-12			455			335	135		310	0
WC415-14			445			300	150		300	- 10
WC435-3			360			350	175		295	- 15
WN328-2			350				245		300	- 5
WN330-1			320				370		345	+ 40
ND7641-3	350		400			270	265		320	+ 20
ND8913-4	300	235	300						280	- 55
ND8914-5	325	270	250						280	- 55
ND9358-3			175				215		195	-120
ND9434-1			315				230		270	- 30
Centennial	220	480	320	85	250	335	280	165	265	- 20
Nampa			415	205	295	320	220	260	285	+ 10
Nooksack	265	250	305	160	340	400	260	275	280	- 5

CALIFORNIA TABLE 4. SUMMARY OF NO. 1 YIELDS (cwt/A) OF ENTRIES IN 1976 YIELD TRIALS

<u>Variety</u>	<u>Kern #5</u>	<u>Kern #8</u>	<u>Shafter</u>	<u>Riverside</u>	<u>Santa Maria</u>	<u>Butte Valley</u>	<u>Tulelake</u>	<u>Salinas Valley</u>	<u>Average</u>	<u>Deviation From Adj. Overall Ave</u>
Nor. Russet			335	225	240	370	335	125	270	0
Rus. Burbank			310	130	260	260	300	245	250	- 20
Targhee			365	120	380	320	215		280	- 5
Wh. Rose	435	520	435	210			280	220	350	+ 75
Average	270	380	355	165	325	325	250	220		

Part B. Chipper Trials

<u>Variety</u>	<u>Kern #6</u>	<u>Humboldt</u>	<u>Shafter</u>	<u>Riverside</u>	<u>Santa Maria</u>	<u>Butte Valley</u>	<u>Tulelake</u>	<u>Salinas Valley</u>	<u>Average</u>	<u>Deviation From Adj. Overall Ave</u>
A503-42	590	325	330	565	580	535	500	365	475	+ 75
B6987-29		260	395	540	425		470		420	+ 10
B7151-4		295	475				335		370	- 5
ND8750-20			450				355		400	- 15
ND8888-1			585				435		510	+ 90
ND8888-2	340		370				355		355	- 50
ND8891-3	440		590				520		515	+110
ND9124-4			410				415		410	- 5
WN352-1	340	245	480	430	495		245	320	365	- 25
Atlantic	470	280	510	310	435		415	335	395	+ 5
Kennebec	385	305	425	505	460	475	400	260	405	+ 5
Nooksack	120	270	305	345	360	400	260	275	290	-110
Average	385	285	445	450	460	470	390	310		

CALIFORNIA TABLE 4. SUMMARY OF NO. 1 YIELDS (cwt/A) OF ENTRIES IN 1976 YIELD TRIALS

Part C. Red Trials

<u>Variety</u>	<u>Kern #7</u>	<u>Humboldt</u>	<u>Shafter</u>	<u>Butte Valley</u>	<u>Tulelake</u>	<u>Salinas Valley</u>	<u>Average</u>	<u>Deviation From Adj. Overall Av</u>
Bison	380	205	355	350	370	175	305	- 65
Chieftain	465	330	410		530	235	395	+ 20
Red La Soda	440	360	610		390	330	425	+ 55
Average	430	300	460	350	430	245		

COLORADO

J. A. Twomey and M. Workman

Potato Seedling and Varietal Evaluation

Seedling Program. Ten thousand first-year potato seedlings were grown in 1976. Two hundred seedlings were selected for further observation and evaluation. From 379 second-year seedlings, 75 were selected for further testing. Fifty advanced seedlings were selected for testing in 1977.

Chipping tests were conducted on 27 advanced and 62 second-year seedlings. Only those which were promising are included in Colorado Tables 1 and 2.

No yield trials were conducted in the San Luis Valley of Colorado in 1976, but results from California and other areas indicate that selections WC 316-1, WC 415-12 and BC 8370-4 are quite promising and will be tested more extensively in 1977.

Colorado Table 1. Chip Color¹ of Second-Year Seedlings at Harvest.

Seedling		Seedling	
No.	Color	No.	Color
BC 9032-13	27.0	WC 697-1	29.5
BC 9020-1	30.0	BC 9106-1	34.0
WC 630-2	30.0	BC 9020-5	28.0
BC 9070-8	27.5	BC 9035-6	30.0
BC 9035-7	26.5	BC 9020-11	25.0
BC 9071-6	27.5	WC 708-6	25.5
BC 8559-1	33.0	BC 9072-1	27.5
BC 9020-13	30.0	BC 9037-1	30.0
BC 8559-2	29.0	BC 9099-3	26.0
BC 9020-7	37.0	BC 9103-3	29.0
WC 679-4	28.5	BC 9072-12	27.0

^{1/} Chip color determined with Photovolt reflectance meter. Color readings of 25 and above are acceptable.

Colorado Table 2. Chip Color^{1/} and Specific Gravity^{2/} of Promising Advanced Seedlings at Harvest and After Harvest.

Seedling No.	At Harvest	Warmed 2 Wks. @ 70° F				Specific Gravity
		3 Wks. 70° F Post Harvest	10 Wks. Storage @ 50° F	10 Wks. Storage @ 40° F	10 Wks. Storage @ 50° F	
	Color	Color	Color	Color	Color	
WC 686-3	34.5	31.0	27.0	15.0	28.0	1.110
WC 672-2	34.0	26.0	29.5	22.0	30.0	1.095
WC 672-9	20.0	26.0	39.0	27.0	35.0	1.102
WC 668-4	35.0	20.0	33.0	25.5	27.0	1.101
WC 661-5	34.0	23.5	27.0	22.0	30.0	1.090
WC 661-13	32.5	28.0	38.0	17.0	34.0	1.099
WC 612-6	37.0	30.5	28.0	15.0	35.0	1.089
WC 521-12	33.0	31.0	25.5	26.0	31.0	1.102
WC 542-8	31.5	20.0	24.5	20.0	28.0	1.101
Snowchip	24.5	32.0	28.0	24.0	35.0	1.085
AK 28-8	31.5	34.0	31.0	15.0	37.0	1.095
WC 661-17	36.0	31.0	23.0	23.5	26.5	1.099

^{1/} Chip color determined with Photovolt reflectance meter. Color readings of 25 and above are acceptable.

^{2/} Specific gravity determined by potato hydrometer.

FLORIDA

J. R. Shumaker, D. P. Weingartner, James Watts, and Raymon E. Webb

Variety and Seedling Trials

Methods. Potato varieties and seedlings were tested for their adaptability, desirable horticultural characteristics, and resistance to tuber symptoms of corky ringspot disease at the Agricultural Research Center, Hastings, Florida. Clones were grown in either advanced (four replications), intermediate (two and three replications), or observational (one replication) trials. Depending on the nature of the test (Procedures, Florida Tables 1, 2, 3, 4, and 5), soil fumigation was applied as follows. In-the-row applications of preplant Telone (8 gpa) or preplant Telone plus band (8 to 10 inches) applications of Temik (3.0 lb ai/acre) at planting. Yield and Tuber appearance and disease ratings were taken at harvest. Tuber samples were shipped to Berwick, Pennsylvania, for specific gravity and chip evaluation.

Advanced, Intermediate, and Observational Yield and Quality Tests (Tables 1, 2, and 3). Several clones produced yields of high quality tubers equal to or greater than those produced by the standard cultivar Sebago. Atlantic (B6987-56) was the outstanding entry in these tests (Table 1 and 2) and has shown promise of being both a superior chip and table stock cultivar for the area. It will be widely grower tested in 1977. Superior-L (Table 2), a late maturing selection from Nebraska, has also shown promise and will be in commercial trials in 1977. Several seedlings from the observational trial (Table 3) will be incorporated into the 1977 intermediate test.

Intermediate Corky Ringspot (CRS) Disease Resistance Evaluations (Table 4). Incidence and severity of CRS (caused by tobacco rattle virus) disease were low to moderate. Six cultivars and 106 seedlings were grown and their tubers evaluated for external CRS symptoms at harvest. CRS symptoms were not observed on tubers produced from Pungo (standard CRS resistant cultivar), Green Mt., Hudson, and 34 seedlings. These clones will be evaluated in 1977 for both external and internal tuber symptoms to further determine their disease reaction.

Florida Table 1. Results from 25 clones selected for advance yield and quality testing at Hastings, Florida--1976.

Clone	Yield			Tuber appear- ance ^{1/}	Specific gravity	Chip color ^{2/}					
	USLA	Total size 'A'	Grand total			Weeks after harvest					Mean
						1	2	3	4	5	
cwt/acre											
Atlantic	268	275	279	6.8	1.076	1	2	2	3	2	2.0
Hudson	232	251	261	5.0	1.071	2	4	5	5	4	4.0
Pungo	222	233	242	5.0	1.069	2	3	3	4	4	3.2
B7859-2	218	225	237	6.5	1.076	2	2	2	4	3	2.6
B7902-4	212	230	238	5.8	1.059	1	2	4	6	5	3.6
B7009-4	201	216	223	6.5	1.064	2	2	5	7	4	4.0
B8392-5	199	209	212	7.0	1.064	2	3	5	6	4	4.0
PA6CX-6	199	217	236	4.5	1.067	1	2	2	3	4	2.4
Sebago	191	202	211	6.0	1.067	1	1	3	3	4	2.4
B6987-29	190	194	201	4.8	1.069	2	1	2	2	3	2.0
Penn 71	189	199	206	4.8	1.063	1	1	2	1	2	1.4
B7516-9	177	188	195	6.5	1.064	3	2	4	4	4	3.4
LaChipper	176	184	199	4.8	1.072	1	2	3	4	3	2.6
CA55-24	175	194	203	5.3	1.069	1	2	3	3	6	3.0
BR7085-1	173	189	201	6.5	1.067	2	1	3	1	3	2.0
CA61-3	170	190	208	4.0	1.076	2	1	1	3	2	1.8
Norchip	155	160	170	5.0	1.071	2	2	3	5	4	3.3
B6969-2	149	156	161	7.3	1.064	1	2	3	3	4	2.6
B7608-2	149	191	209	6.0	1.051	2	1	5	2	3	2.6
Superior	148	153	163	6.3	1.069	2	2	3	3	4	2.8
BR6863-3	137	143	149	6.5	1.071	3	2	2	1	3	2.2
B7802-2	133	139	142	7.3	1.064	2	2	3	5	4	3.2
CA46-11	127	137	146	7.0	1.062	1	1	1	3	4	2.0
B7902-9	116	131	138	5.3	1.071	1	2	2	4	3	2.4
B7160-4	113	170	183	6.3	1.055	1	1	3	4	4	2.6

LSD .05	46	49	47	2.8	-	-	-	-	-	-	-
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^{1/} From 9.0 = most desirable to 0.0 = completely undesirable.

^{2/} Chip color 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row at planting. Replications = 4. Plot = 20 hill units (20 ft). Planted = 2/13/76. Harvested = 5/25/76.

Florida Table 2. Results from 40 clones selected for intermediate yield and quality testing at Hastings, Florida--1976.

Clone	Yield			Tuber quality rating ^{1/}	Specific gravity	Chip Color ^{2/}					
	US1A	Total size 'A' cwt/acre	Grand total			Weeks after harvest					Mean
						1	2	3	4	5	
B7629-1	319	327	333	5.3	1.058	2	2	2	4	4	3.2
B7151-4	294	309	319	4.3	1.073	2	2	3	3	3	2.6
B7139-4	293	307	310	4.3	--	-	-	-	-	-	-
Atlantic (USDA)	280	290	299	6.3	1.076	1	2	2	3	2	2.0
B7629-1	275	294	301	6.0	1.058	2	2	2	4	4	2.8
B7583-6	269	290	302	7.0	1.064	2	3	5	6	5	4.2
B7151-4	267	286	295	5.3	1.073	2	2	3	3	3	2.6
B7595-7	263	272	284	6.0	1.069	1	3	4	4	4	3.2
B8185-6	250	274	285	4.5	1.056	2	2	3	4	3	2.8
B7866-3	244	257	266	6.3	1.060	2	2	3	3	5	3.0
Superior-L	241	248	256	6.6	1.067	2	2	2	1	2	1.8
B7151-4	240	258	270	5.7	1.073	2	2	3	3	3	3.6
B8497-36	234	249	257	7.0	1.064	1	3	3	2	4	2.6
Atlantic(Va)	225	228	236	6.0	1.067	1	2	3	4	4	2.8
B7592-1	223	227	240	7.0	1.069	2	2	2	4	3	2.6
B8392-5	223	229	234	7.0	1.064	2	3	5	6	4	4.0
B7930-2	218	226	242	6.3	1.067	2	2	3	3	4	2.8
B8393-6	213	232	247	6.3	1.058	2	4	3	5	4	3.6
B7621-9	208	223	230	6.0	1.062	2	2	2	3	5	2.8
Pungo	203	213	221	5.7	1.069	2	3	3	4	4	3.2
LaRouge	199	208	220	3.7	--	-	-	-	-	-	-
B8004-8	190	218	226	8.0	1.057	2	3	2	4	5	3.2
Sebago	183	189	198	6.0	1.059	1	3	3	6	5	3.6
B8314-5	180	211	221	4.0	1.061	2	1	2	4	4	2.6
B7848-19	179	190	194	6.7	1.069	2	2	2	3	3	2.4
B7863-6	176	223	229	4.3	1.060	2	2	3	3	5	3.0
B8392-7	173	182	186	5.0	1.067	2	2	4	4	4	3.2
B7618-6	169	172	179	6.0	1.063	3	2	3	5	4	3.4
B7897-1	159	166	172	5.3	1.057	2	2	3	4	3	2.8
B7200-26	148	152	163	6.7	1.074	1	3	1	3	2	2.0
Wauseon	136	140	149	6.0	1.066	1	2	1	4	3	2.2
B7147-8	127	128	145	6.3	1.058	3	2	3	4	6	3.6
B6503-2	126	137	144	6.7	1.069	1	1	2	2	3	1.8
Superior (Maine)	114	116	134	6.0	1.069	3	2	2	4	3	2.8
B7848-23	114	115	127	5.0	1.065	5	5	5	7	5	5.4
B8543-9	108	113	124	6.7	1.074	2	2	4	2	3	2.6
B8339-4	107	117	132	6.3	1.063	6	6	8	8	8	7.8
B8339-4	95	96	110	5.7	1.061	6	5	7	8	7	7.0
B7636-15	93	98	118	5.7	1.066	5	3	6	7	5	5.2
B7636-15	93	94	111	5.0	1.070	3	2	5	5	5	4.0
LSD .05	56.9	61.3	60.9	1.7	--	-	-	-	-	-	-

Florida Table 2. (Continued)

1/ From 9.0 = most desirable to 0.0 = completely undesirable.

2/ Chip color 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row at planting. Replications = 3. Plot = 20 hill units (20 ft). Planted = 2/13/76. Harvested = 5/25/76.

Florida Table 3. Results from 37 clones selected for observational yield and quality testing at Hastings, Florida--1976.

Clone	Yield					Chip Color ^{2/}					
	US1A	Total size 'A' cwt/acre	Grand total	Tuber quality rating ^{1/}	Specific gravity	Weeks after harvest					Mean
						1	2	3	4	5	
B8428-6	195	217	230	6	1.069	3	2	3	2	5	3.0
B8428-10	220	225	233	7	1.069	2	2	2	3	5	2.8
B8429-1	151	170	172	5	1.065	3	4	3	4	3	3.4
B8430-10	127	127	152	4	1.062	3	4	5	4	5	4.2
B8432-1	107	245	260	2	--	-	-	-	-	-	-
B8434-15	172	176	191	8	1.075	2	3	3	4	3	3.0
B8435-13	125	125	134	3	1.071	2	4	3	3	3	3.0
B8443-5	263	277	283	4	1.067	2	2	1	2	3	2.0
B8462-1	223	230	244	6	1.071	1	2	2	4	3	2.4
B8477-10	315	321	327	4	1.069	1	1	1	4	3	2.0
B8477-12	232	246	251	4	1.057	1	1	2	3	2	2.0
B8497-24	345	352	363	5	1.057	2	2	2	4	4	2.8
B8497-36	221	247	256	7	1.064	1	3	3	2	4	2.6
B8498-9	128	132	142	8	1.064	2	2	3	3	3	2.6
B8500-27	213	221	228	4	1.069	1	2	2	4	4	2.6
B8501-10	205	205	213	7	1.071	3	2	3	2	4	2.8
B8509-2	133	139	148	3	1.071	2	2	1	4	3	2.2
B8522-11	175	180	190	5	1.075	4	2	3	3	5	3.4
B8530-7	154	191	196	7	1.058	2	3	6	7	5	4.6
B8530-9	72	72	78	5	1.058	2	2	3	4	4	3.0
B8542-10	113	117	130	7	1.070	4	3	5	3	4	3.8
B8543-11	164	175	179	5	1.066	2	3	2	4	4	3.0
B8543-16	130	130	142	6	1.075	1	5	4	6	6	4.4
B8546-6	209	240	256	3	1.071	3	2	2	1	2	2.0
B8575-5	273	273	275	5	1.069	3	3	5	6	5	4.4
B8590-11	140	145	152	7	1.063	1	1	2	1	2	1.4
B8596-4	155	158	165	4	1.066	1	1	2	1	3	1.6
B8598-5	207	212	220	8	1.067	1	1	3	5	4	2.8
B8598-8	123	132	147	8	1.071	2	3	3	4	4	3.2
B8598-9	159	165	172	7	1.064	1	1	1	4	3	2.0
B8615-1	171	211	217	3	1.071	3	3	5	3	7	4.2
B8615-2	201	214	220	8	1.070	2	1	2	4	3	3.4
B8618-5	111	169	175	6	1.067	1	2	2	4	4	2.6

Florida Table 3. (Continued)

Clone	Yield					Chip Color ^{2/}					
	US1A	Total size 'A' cwt/acre	Grand total	Tuber quality rating ^{1/}	Specific gravity	Weeks after harvest					Mean
						1	2	3	4	5	
B8625-11	296	296	315	7	1.071	1	2	5	5	5	3.6
B8625-15	196	202	222	7	1.064	1	1	3	5	4	2.8
Sebago	224	242	257	6	1.062	1	2	1	5	3	2.6
Pungo	219	234	247	5	1.067	2	2	4	4	4	3.2

^{1/} From 9.0 = most desirable to 0.0 = completely undesirable.

^{2/} Chip color 1-4 = acceptable; 5 = borderline; 6-9 = too dark for use.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone + 3 lb ai/A Temik in-the-row at planting. Replications = 1. Plot = 15 hill units (15 ft). Planted = 2/13/76. Harvested = 5/25/76.

Florida Table 4. Results from 113 clones selected for intermediate corky ring-spot (CRS) disease testing at Hastings, Florida--1976.

Clone	Yield			Tuber ratings ^{1/}	
	US1A	Total size 'A'	Grand Total	(CRS)	
				External	Appearance
		cwt/acre			
B6503-2	157	188	195	6.3	6.7
B6965-10	169	184	188	8.5	4.0
B6969-2	163	188	167	9.0	7.3
B6987-29	237	242	249	8.9	5.4
B6987-43	184	197	206	9.0	3.0
B7009-4	280	300	306	6.5	6.0
B7139-4	331	370	378	6.0	5.5
B7147-8	151	154	168	9.0	6.0
B7151-4	306	335	342	8.5	6.0
B7152-1	179	180	191	9.0	6.5
B7152-3	118	130	144	6.5	6.5
B7152-12	175	135	213	7.0	5.5
B7153-29	167	170	182	9.0	6.0
B7160-4	166	191	205	8.0	6.0
B7164-25	179	186	189	9.0	4.0
B7167-2	102	112	122	8.5	5.5
B7200-26	151	159	167	8.8	6.0
B7516-9	216	255	263	6.0	7.0
B7552-3	135	175	182	8.0	3.5
B7583-6	321	325	333	9.0	7.0
B7592-1	240	242	254	8.5	6.5
B7595-3	254	267	273	9.0	2.5
B7595-7	235	260	276	9.0	7.0
B7603-1	130	146	176	8.5	2.5
B7618-6	171	180	188	7.5	6.0
B7620-7	122	135	144	6.0	7.0

Florida Table 4. (Continued)

Clone	US1A	Yield		Tuber ratings ^{1/}	
		Total size 'A'	Grand Total	(CRS) External	Appearance
		cwt/acre			
B7621-1	246	257	267	9.0	5.5
B7621-9	293	295	304	9.0	6.0
B7629-1	283	304	310	9.0	5.3
B7636-15	97	101	113	8.8	5.0
B7680-3	82	92	112	7.5	7.5
B7680-11	138	164	192	5.0	5.5
B7744-4	122	140	146	9.0	6.5
B7767-2	68	72	91	9.0	3.0
B7783-8	99	123	133	8.5	4.0
B7828-9	193	194	206	9.0	6.5
B7832-2	142	159	166	9.0	6.0
B7845-6	108	116	127	9.0	6.0
B7845-14	191	206	219	8.5	7.0
B7845-19	153	161	168	8.5	6.0
B7845-23	135	140	156	8.5	5.0
B7845-29	52	52	74	9.0	4.0
B7848-19	150	157	160	9.0	5.5
B7848-23	197	203	223	8.8	5.0
B7858-6	90	107	129	9.0	3.5
B7859-2	223	229	240	8.0	6.0
B7863-1	106	139	146	6.5	6.5
B7863-6	121	172	178	5.0	4.0
B7865-12	154	216	233	6.0	5.5
B7866-3	297	331	338	7.0	5.5
B7871-5	172	192	196	7.0	7.0
B7888-7	159	181	199	7.5	5.5
B7888-8	169	205	211	5.5	5.5
B7897-1	203	235	252	6.0	7.0
B7902-4	184	197	201	9.0	6.5
B7902-9	153	161	166	9.0	3.5
B7930-2	178	212	229	6.0	5.0
B8004-8	102	196	206	6.5	7.0
B8019-7	139	147	154	9.0	6.0
B8036-1	143	151	159	8.0	4.4
B8088-2	103	117	139	7.5	6.5
B8090-5	159	165	298	8.5	4.0
B8091-8	48	71	78	7.5	4.5
B8178-4	36	39	50	8.0	3.5
B8181-3	118	130	156	8.3	5.0
B8185-6	258	269	276	8.0	5.5
B8247-1	78	83	107	9.0	7.0
B8261-3	100	102	110	8.5	6.5
B8281-4	78	91	103	8.0	5.5
B8285-3	169	172	188	9.0	4.3
B8314-5	154	178	187	8.0	4.0
B8318-4	154	155	174	7.7	3.3
B8331-4	85	89	114	8.5	5.0
B8336-3	154	163	178	8.3	4.8
B8339-4	96	102	112	9.0	5.8

Florida Table 4. (Continued)

Clone	US1A	Yield		Tuber ratings ^{1/}	
		Total size 'A'	Grand Total	(CRS) External	Appearance
		cwt/acre			
B8392-5	231	254	261	9.0	6.3
B8392-7	171	230	233	3.0	5.0
B8393-5	131	143	152	8.0	6.0
B8393-6	290	296	316	8.5	6.0
AF25-18C	224	231	246	9.0	5.0
BR6863-3	178	195	205	8.0	6.0
BR7085-1	139	147	205	8.0	6.0
BR7093-23	266	313	325	7.5	6.0
CA46-11	160	169	175	7.0	7.0
CA55-24	191	199	203	7.5	6.0
CA61-3	123	133	148	9.0	5.5
CA63-1	159	181	189	8.5	7.0
CC05-17	248	248	251	9.0	6.5
CC08-3	255	323	334	5.5	5.0
CC54-8	145	146	152	9.0	4.5
CC56-8	144	162	169	9.0	5.0
CD12-18	191	203	212	8.0	6.5
CD34-2	216	221	235	9.0	5.0
CD47-32	195	208	215	6.5	7.0
CD100-9R	152	223	236	9.0	4.0
CD106-16	122	138	146	9.0	4.5
CD111-9	134	154	159	6.5	6.5
CD130-7R	200	209	293	8.0	7.0
6CX-6	169	175	189	9.0	3.5
8ER-12	135	139	149	8.0	6.5
8ET-6	180	190	196	5.5	5.5
8OD-2	87	93	108	8.5	3.0
8SA-1	184	190	195	7.0	5.5
8TG-1	101	120	127	7.5	6.5
8TX-3	109	129	139	6.5	6.0
8YL-1	101	104	127	8.0	6.0
8YY-3	246	288	293	9.0	4.0
Atlantic	286	289	293	9.0	7.3
Green Mt.	248	255	269	9.0	3.2
Hudson	252	272	282	9.0	4.8
Penn 71	204	216	228	6.5	6.0
Pungo	208	220	229	6.9	6.6
Sebago	207	233	241	9.0	5.2

^{1/} From 9.0 = none or most desirable to 0.0 = most severe (100%) or undesirable.

PROCEDURES: Soil fumigation = 8 gpa preplant Telone. Replications = 2, except (i) B6503-2, B6969-2, B6987-29, B7151-4, and B7200-26, Green Mt. and Hudson each = 6 (ii) Atlantic = 8 and (iii) Pungo and Sebago each = 16. Plot = 20 hill units (20 ft). Planted 2/13/76. Harvested 5/26/76.

PACIFIC NORTHWEST (IDAHO & EASTERN OREGON)

J. J. Pavék, D. C. Corsini, C. Stanger, & R. E. Ohms

Yield Trials

Weather. The spring weather was favorable for planting on time -- during the last two weeks of April in Eastern Oregon and during the first two weeks of May for Central and Eastern Idaho. May temperatures were slightly above normal across the region. June and July temperatures were near normal in the west to slightly below in the east. August was more than 4°F below normal in all parts of the region, but the first two weeks of September were warmer than normal. Frost on June 26 at Aberdeen froze the plants to within 3 inches of the ground. Hail on August 2 at the Twin Falls station set the plants back about two weeks. The first killing frost occurred at Aberdeen on September 9.

The advanced late harvest trials were conducted at Aberdeen and Twin Falls (Kimberly) Stations in Idaho and at Malheur Station, Ontario, Oregon. The soils at each location were of silty loam and fertilization was according to soil tests. Water was applied as needed in furrows at Aberdeen & Malheur, and through sprinklers at Twin Falls. Sencor herbicide was applied post emergence to the plots at Twin Falls and Malheur Stations; Eptam and Treflan were used pre-emergence at Aberdeen. The tuber yields and quality data for the top 12 entries (according to yield), out of a total of 26 entries, plus Russet Burbank are shown in PNW Table 1. The specific gravities were unusually low at Aberdeen, probably as a result of the June frost and the cool August temperatures. Poor baked textures were found in certain entries (e.g. A6371-2) with these lower specific gravities.

The advanced early harvest yield trials were conducted at Aberdeen and Malheur Stations. Harvest at Malheur Station was on August 3 and at Aberdeen on August 18. The results are presented in PNW Table 2. The Sencor herbicide probably was responsible for the low yield of 'Pioneer' at Malheur Station. The yields at Aberdeen were much lower than usual, probably because of the June frost.

Disease reactions. All selections in late harvest yield trials were evaluated for naturally occurring Verticillium wilt and common scab, and to artificially inoculated Fusarium dry rot. Most selections in the 1975 yield trials were scored for net necrosis and chronic leafroll in 1976. The results for the advanced yield trial clones are presented in PNW Table 3. The scab data are omitted; only A69657-4 appeared susceptible.

Distribution

A summary of distribution of breeding selections, named varieties, and seedling tubers during 1976 is shown in PNW Table 4.

PNW Table 1. Advanced Yield Trial, 1976 Tuber Yields and Quality^{1/}

Clone	Loc ^{2/}	Total cwt/A	US No. 1		French Fries ^{3/}		Baked ^{4/} Tex.	Vit ^{5/} C	Protein % DWB	Hollow Heart >12 oz %	Shape/ Rus. ^{6/}
			Tot %	>10 oz %	Color 45° 40°	Dark Ends %					
A69113-1	Ab	371	74	37	0.6	2.3	8	18.8	7.6	-	0 (Wt)
	TF	437	83	59	0.7		27	3.1		12	
	Ma1	369	72	31							
A66122-3	Ab	352	72	29	0.8	1.1	8	26.3	5.3	6	L-0, M
	TF	380	88	54	0.8		60	3.1			
	Ma1										
A68113-4	Ab	341	74	31	1.1	1.9	17	16.8	6.2	-	L (Wt)
	TF	446	76	49	0.8			3.0		0	
	Ma1										
A66107-51	Ab	336	83	39	0.7	2.1	0	21.7	7.0	-	0, M
	TF	407	76	39	0.5		20	3.3		16	
	Ma1	519	65	19	0.7		41			0	
A69657-4 ^{7/}	Ab	331	78	28	1.0	0.8	0	15.4	7.0	-	0, Lt
	TF	331	80	35	0.5		7	3.2		4	
	Ma1	512	73	32	0.6		29			1	
A70758-3	Ab	331	80	34	0.5	2.6	42	21.0	7.7	-	0, M ⁻
	TF	461	91	66	0.7		0	3.4		4	
	Ma1										
A66102-16	Ab	309	71	21	1.2	0.9	0	22.3	7.6	-	0, Lt
	TF	411	85	58	0.6		0	3.3		0	
	Ma1	473	68	26	1.0		8			0	
A70271-6	Ab	300	61	10	0.7	0.7	0	17.0	6.5	-	0, Lt
	TF	416	61	24	0.5		20	3.1		0	
	Ma1							3.1			

PNW Table 1. (continued)

Clone	Loc ^{2/}	Total cwt/A	US No. 1		French Fries ^{3/}		Baked Tex.	Vit. ^{5/} C	Protein % DWB	Hollow Heart >12 oz %	Rus. ^{6/}
			Tot %	>10 oz %	Color 45°	Dark Ends %					
A701057-5	Ab	299	82	32	0.7	1.7	25	22.7	6.7	-	0, Lt
	TF	378	85	50	0.6		33			24	
	Mal										
A69827-2	Ab	290	82	44	1.0	1.0	0	16.8	8.1	-	0-L, Lt
	TF	390	93	68	0.7		20			0	
	Mal	524	77	43	0.8		44			1	
A68678-1	Ab	285	70	27	0.7	0.5	17	21.0	7.1	-	L-0, M
	TF	419	88	50	0.9		27			47	
	Mal	469	71	31	0.6		21			5	
A6371-2	Ab	282	69	17	0.8	1.7	0	26.9	8.1	-	L, M ⁻
	TF	346	79	28	0.6		33			12	
	Mal	515	72	29	1.3		47			1	
Russet B.	Ab	250	60	19	0.5	1.2	25	16.7	6.9	-	L, M
	TF	322	69	24	0.5		13			8	
	Mal	517	59	13	0.7		58			2	
LSD.05	Ab	57						2.2	1.0		
	TF	78									
	Mal										

1/ Top 50% of entries according to total yield plus Russet Burbank check. 20 hills, 4 reps, Aberdeen and Malheur; 20 hills, 5 reps Twin Falls.

2/ Ab = Aberdeen Station; TF = Twin Falls Station; Mal = Malheur Oregon Station.

3/ 45°F = stored 4 months at this temperature prior to fry; 40°F = stored 2 months at 45° followed by 2 months at 40°F; 0.5 (lightest) to 4.0 (darkest).

4/ 1.0 (soggy) to 4.0 (dry, mealy).

5/ Mg. total ascorbic acid per 22 g dry matter, approximately equal to mg/100 g fresh weight.

6/ 0 = oblong, L = long, Lt = light russetting; M = medium russetting.

7/ A69657-4 is 50% S. andigena.

PNW Table 2. Advanced Early Harvest Yield Trial (4 reps of 20 hills) - 1976

	Malheur Station (Oregon)					Aberdeen Station (Idaho)				
	Total cwt/A	Tot %	>10 oz %	Spec. Grav.	FF ₁ / Clr.	Total cwt/A	Tot. %	>10 oz %	Spec. Grav.	FF ₁ / Clr.
A68588-16	431	69	41	1.075	0.5	150	63	6	1.079	0.7
NDA8694-3	421	79	36	76	0.9	170	61	5	73	0.5
A68710-5	419	78	33	77	0.9	139	71	10	79	1.3
A66107-12	401	78	26	78	1.0	156	70	3	80	1.3
ALR22-2	397	77	30	77	0.7	200	71	19	80	0.6
A70812-2						197	81	13	77	0.9
NDA8451-3	375	81	32	67	0.7	168	70	6	73	0.5
A68587-3	368	67	36	80	0.5	233	76	22	83	0.7
NDA8856-11						167	75	12	83	0.6
A68599-1	356	77	22	81	0.5	111	42	7	87	0.5
A6680-5	345	70	24	75	0.6	157	75	6	80	0.9
A67341-4	325	67	22	68	0.7	114	64	5	74	1.6
Pioneer	290	89	31	76	1.2	206	83	16	83	0.6
LSD .05				.005	0.8	36			.008	0.6

1/ Fried within 5 days of harvest, 0.5 (lightest) to 4.0 (darkest).

2/ Shape: L = long, L-0 = long-oblong, 0-R = oblong-round; Russetting: M = medium.

PNW Table 3. Disease Evaluations for Advanced Selections - 1976

Clone	Vert. Wilt % ^{1/}	Fusarium Dry Rot ^{2/}	Maximum Dry Rot Score	Secondary Leafroll Severity ^{3/}	Net Necrosis % ^{4/}	Severity Net Necrosis ^{5/}
A5400-15	27	1.7	4	-	-	-
A6371-2	27	2.1	4	(a) 7.6 (b) 2.3	12	1.0
A66102-16	6	1.8	5	(a) 2.3 (b) 2.7	33	3.0
A66107-51	0	3.0	5	-	-	-
A66122-3	9	3.2	5	(a) 3.0 (b) 3.0	55	1.7
A68113-4	1	3.3	5	(a) 2.4 (b) 1.5	16	3.0
A68678-1	19	2.4	5	(a) - (b) 2.3	2	1.0
A68681-1	18	2.1	3	-	-	-
A69327-5	4	2.7	4	-	-	-
A69657-4	14	2.4	4	(a) - (b) 2.0	5	1.3
A67142-1	1	2.4	4	(a) - (b) 2.4	4	1.0
A68689-1	39	3.2	4	(a) 2.2 (b) 2.1	34	4.0
A69113-1	2	2.5	4	(a) - (b) 2.8	5	0.7
A69337-6	45	3.1	5	(a) - (b) 3.4	0	0
A69827-2	11	1.5	3	(a) 0.3 (b) 0.2	17	0.7
A69827-4	10	1.4	3	(a) 4.3 (b) 4.0	24	2.7
A69868-2	28	1.2	2	(a) - (b) 2.0	8	0.7

continued
PNW Table 3

Clone	Vert. Wilt % ^{1/}	Fusar. Dry Rot ^{2/}	Maximum Dry Rot Score	Second Leafroll Severity ^{3/}	Net Necrosis % ^{4/}	Severity Net Necrosis ^{5/}
A69870-10	1	2.0	4	(a) 1.1 (b) 1.4	26	3.7
A70271-6	4	2.6	4	(a) - (b) 3.2	0	0
A70758-3	5	3.5	5	(a) 1.9 (b) 2.3	19	2.3
A701040-3	38	2.8	5	(a) 2.7 (b) 2.9	16	1.3
A701057-5	24	2.8	4	(a) 2.0 (b) 2.7	16	2.7
ATD27-1	2	1.9	4	(a) 2.3 (b) 1.1	15	1.0
C12-1	14	3.7	5	(a) - (b) 2.2	11	2.0
Russet B.	11	2.8	5	(a) 4.2 (b) 2.5	39	4.0
Targhee	6	2.3	4	(a) 4.0 (b) 3.9	23	3.0
A63126-9	17	3.7	5	-	-	-

^{1/} % stems showing >75% yellowing-death out of 50 stems/plot (mean of 4 replicates) 1 September 1976.

^{2/} Fusarium rot: 1 = No advancing infection; 5 = 75% or more of tuber rotted after 42 days at 50°F (Mean value of 9 replicates from 2 locations).

^{3/} (a) seed showing net necrosis; (b) seed showing no net necrosis; 0 = no symptoms 5 = very strong symptoms of chronic leafroll. Approx. 50 hills were evaluated per clone.

^{4/} Approx. 50 tubers were evaluated/clone.

^{5/} 0 = none, 1.0 = slight, 4.0 = severe.

PNW Table 4. Distribution of Selections, Varieties, and Seedlings - 1976.

Location	Cooperator	Number
<u>Clones</u>		
Canada	S. Dubetz & J. Klassen	1
	W. Russell	5
Idaho	G. Anderson	8
	M. Funk & J. Chapman	1
	J. Pahl	1
	R. Robinette	7
	G. Vogt	16
	L. Williams	2
Kansas	R. Toten	6
Maine	R. Nickeson	6
Maryland	R. Webb	2
Minnesota	F. Lauer	2
Netherlands	D. Meyer	3
Ohio	A. Mosley	2
Oregon	J. Burr	8
	G. Carter	3
	T. Davidson	9
	M. Johnson	88
Texas	D. Smallwood & J. C. Miller, Jr.	22
Trinidad	E. Small	4
Washington	L. Hiller	8
	W. Hoyman	3
	M. Martin	33
Wisconsin	R. Hanneman	6
Wyoming	K. Bohnenblust	8
<u>Seedlings</u>		(Families)
North Dakota	R. Johansen	185
Texas	D. Smallwood	63
Washington	M. Martin	104

LOUISIANA

J. F. Fontenot, D. W. Newsom, R. J. Constantin, and H. M. Brewer

Potato Breeding and Development

Objectives. The principal objectives of the Louisiana potato breeding project are wide adaptability, high yield, frost- heat- and drought-resistance, insect- and disease-resistance (particularly late blight and scab), improved culinary quality (including chipping quality, french frying quality, and baking quality), resistance to after-cooking darkening, improved storage ability, better shape and skin color and resistance to tuber greening. Development of an oblong russet type adapted to Louisiana conditions is highly desirable.

Other objectives are to gain a further insight into the physiological changes during rest and to ascertain the effect of growth regulators, applied as pre-plant, preharvest and postharvest treatments on the production, storage ability and quality of potatoes.

Our 1975 clones (Table 2) were harvested on September 21, 1976, at Starks' Farm. After a very dry growing season, 44 clones were considered worthy of further study. Originally 261 clones were selected in the field that year and after growing them in Louisiana under field conditions the number selected for increase was 162. Many of these clones were considered outstanding in tuber type and culinary quality.

After screening our 1974 clones (Table 3), only eight were considered of merit to more study. Nine clones selected in 1973 (Table 4) were estimated to have valuable traits that would benefit our program. Information in Tables 5 and 6 involves our advanced lines and regional trial entries. The regional trial report was submitted to another publication. In this report ND 8891-3 was rated first; La 11-118 was rated second; La 11-24 was rated third, and Wisc 729R was rated fourth. It must be remembered that Red LaSoda and LaChipper were not used in this comparison.

Results of a potato trial conducted at the North Louisiana Experiment Station are presented in Table 7. Red LaSoda and 11-118 were the best looking clones in this test. In general, yields were very good, but yields of some entries were lowered by poor standards.

Red LaSoda and LaChipper were superior in the test conducted at the Plaquemines Parish Experiment Station (Table 8).

Louisiana Table 1. Number of clones and families selected in the greenhouse at Baton Rouge, Louisiana, and in the field at Rhinelander, Wisconsin, in 1976.

Families	# Selected in Greenhouse 1/76	% Selected Greenhouse	# Selected in Wisconsin 1976	% Selected Wisconsin	% of All Field Selections
1. 11-150 ♀	937	56	31	3.3	13.8
2. 01-115	394	44	16	4.1	7.1
3. 01-115 x 21-59	200	81	14	7.0	6.2
4. 11-68 ♀	96	83	8	8.3	3.6
5. 81-50 ♀	230	78	3	1.3	1.3
6. 11-1 x 11-24	41	72	3	7.3	1.3
7. 11-24 ♀	160	70	4	2.5	1.8
8. 11-24 x Alaska	63	61	2	3.2	0.9
9. 11-24 x 11-1	74	88	5	6.8	2.2
10. 11-24 x 01-70	111	83	12	10.8	5.3
11. 11-94 ♀	458	83	25	5.5	11.1
12. 11-94 x 21-71	186	81	6	3.2	2.7
13. 11-89 ♀	652	60	12	1.8	5.3
14. 12-34 ♀	151	10	2	1.3	0.9
15. 12-34 x Norland	31	52	3	9.7	1.3
16. 12-34 x 12-206	70	58	2	2.9	0.9
17. 12-36 ♀	26	3	1	3.8	0.4
18. 12-36 x 12-34	120	45	8	6.7	3.6
19. 12-36 x 12-206	6	50	1	16.7	0.4
20. 11-74 ♀	577	59	16	2.7	7.1
21. 11-74 x 21-71	92	96	3	3.3	1.3
22. 12-206 ♀	4	44	3	75.0	1.3
23. 12-206 x 22-78	297	60	3	1.0	1.3
24. 21-98 ♀	217	63	1	0.5	0.4
25. 21-98 x 01-70	123	83	1	0.8	0.4
26. 21-99 ♀	261	62	5	1.9	2.2
27. 21-71 ♀	120	48	1	0.8	0.4
28. 21-71 x 01-70	178	81	2	1.1	0.9
29. 22-83 x 12-206	76	44	6	7.9	2.7
30. 21-31 x 21-59	147	78	1	0.7	0.4
31. 31-49 ♀	78	99	6	7.7	2.7
32. LaChipper	30	86	1	3.3	0.4
33. 11-118 ♀	384	68	7	1.8	3.1
34. 12-34 x 12-36	288	46	5	1.7	2.2
35. 12-36 x Norland	212	37	6	2.8	2.7

Louisiana Table 2. Notes on 1975 clones saved at Wisconsin in fall 1976

	Parentage	After ^{1/} Cooking Darkening	^{2/} Chip Color	Color ^{3/} French Fries	Remarks
51-1	Cobbler x 11-89	4.0	4.2	-	
51-7	Cobbler x 11-113	1.0	3.3	-	very good type
51-16	Cobbler x 11-199	3.0	3.7	1.3	
51-18	Cobbler x 11-199	1.8	3.8	1.8	one sprout
51-21	Cobbler x 11-199	1.8	5.7	4.0	
52-30	Cobbler x 1859				
51-31	Raritan x 11-89	3.3	5.7	2.0	very good type
51-34	Raritan x 11-113	1.8	4.0		
51-40	71-82 x 11-199				very good type
51-41	71-82 x 11-199	1.8	3.3	0.5	very good type, seed
51-45	71-82 x 11-199	4.3	3.8	3.0	
51-51	71-82 x 11-199	3.5	2.2	1.0	very good type
51-52	Wisc. 623 x 11-199	2.3	3.7	3.0	very good seed
51-53	Wisc. 623 x 11-199	3.8	3.8	2.5	very good seed
52-72	12 - 36	2.8	7.0	3.8	
52-74	12 - 36	1.8	6.7	4.0	very good type
51-89	ND 7710-5 x 11-199	2.8	2.8	2.0	very good seed
52-96	*12-36	3.5	8.3	4.0	
51-106	01-70	4.0	3.7	3.0	very good type
51-108	11-6	3.3	4.3	3.8	very good type
51-109	11-21	3.5	3.3	1.5	
52-120	12-33	2.8	5.8	2.8	
52-122	12-33	2.5	4.3	3.0	very good type
52-147	12-36	3.5	4.5	2.3	very good seed
52-152	12-40	3.0	5.7	3.0	very good type
51-153	11-44	2.5	4.7	2.0	very good type
52-154	12-51	2.0	5.0	2.8	very good type
51-169	11-57	2.3	4.3	2.3	
52-172	12-36	3.5	4.5	2.3	
51-185	11-75	3.5	3.5	1.0	
51-193	11-103	4.0	3.5	2.8	
51-200	11-105	2.5	4.7	2.3	no apical domn.
52-206	12-206	3.5	3.0	1.0	
51-212	11-208	1.8	4.5	2.3	very good type
51-214	11-208	2.5	5.5	3.0	
51-223	21-31	2.5	6.8	2.0	
51-225	21-31	2.5	2.3	2.0	very good type
51-226	21-31	2.0	4.5	3.0	
51-232	21-71	2.5	3.0	-	
51-236	21-71	3.0	4.8	1.0	very good type
51-238	21-96	2.5	2.5	0.3	
52-242	12-36	1.3	5.2	2.0	very good type
52-243	12-36	2.5	4.7	2.5	
52-257	22-119	2.5	5.0	4.0	very good type

1/ After cooking darkening: Rated 1 (white) to 5 (gray)

2/ Chip color: Rated 1 (lightest) to 10 (darkest)

3/ Color of french fries: Rated 0 (white) to 4 (dark)

Louisiana Table 3. Notes on 1974 clones grown at Burden - 1976

Clones	Parentage	Average Yield U.S. #1 (Cwt/A)	Total Average Yield (Cwt/A)	<u>1/</u> After Cooking Darkening	<u>2/</u> Chip Color	<u>3/</u> Color French Fries
41-1	B 6495-12 x 71-110	106.7	139.3	2.0	4.7	3.5
41-2	B 7200-8 x 71-110	51.2	71.8	2.0	4.7	3.0
41-3	B 7200-8 x 71-110	28.3	64.2	2.0	3.8	3.0
41-5	7808-1 x 71-110	89.3	105.6	2.0	4.2	1.5
43-18	51-138 x 1859	107.8	145.8	3.8	4.2	2.3
42-38	12-142 x 62-104	179.6	261.2	3.0	6.5	3.0
42-44	12-36 Ø	63.1	106.7	3.0	7.3	4.0
41-62	12-34 Ø	115.4	162.2	2.5	6.5	2.3
Red LaSoda	Triumph x Katahdin (Mutant)	231.8	349.3	2.3	4.2	2.5
La Chipper	Green Mt. x Cayuga	162.2	223.1	2.0	1.8	1.0

1/ After cooking darkening: Rated 1(white) to 5(gray)

2/ Chip color: 1(lightest) to 10(darkest)

3/ Color of french fries: Rated 0(white) to 4(dark)

Louisiana Table 4. Notes on 1973 clones at Burden - 1976

Clones	Parentage	Average Yield U.S. #1 (Cwt/A)	Total Average Yield (Cwt/A)	1/ After Cooking Darkening	2/ Chip Color	3/ Color French Fries	Specific Gravity
12-34	62-104 x A2-22-222	83.8	106.7	3.0	4.3	3.5	1.071
31-76	61-71 x 71-110	67.5	98.0	2.5	2.3	1.3	1.078
31-83	61-71 x 71-110	114.3	143.7	2.0	3.7	2.3	1.077
31-94	61-71 x 71-110	81.6	119.7	2.5	4.8	2.8	1.075
31-98	61-71 x 71-110	90.3	131.7	2.0	4.7	3.0	1.070
31-124	Minn. 1317 x 71-110	157.8	188.3	4.0	4.5	2.5	1.080
31-128	Minn. 1317 x 71-110	144.7	189.4	3.0	4.5	2.3	1.070
31-143	71-80 x 71-110	64.2	87.1	3.5	3.7	2.0	1.070
31-150	71-80 x 71-110	65.3	80.6	3.0	6.3	3.0	1.069
31-194	51-176 x 1859	63.1	90.3	2.5	3.8	1.5	1.073
Red LaSoda	Triumph x Katahdin (Mutant)	130.6	149.1	2.3	4.2	2.5	1.072
La Chipper	Green Mts. x Cayuga	157.8	192.6	2.0	1.8	1.0	1.080

1/ After cooking darkening: Rated 1(white) to 5(gray)

2/ Chip color: 1(lightest) to 10(darkest)

3/ Color of french fries: Rated 0(white) to 4(dark)

Louisiana Table 5. Notes on advanced clones grown at Burden--1976.

Clones	Parentage	Average Yield U.S. #1 (Cwt/A)	Total Average Yield (Cwt/A)	After ^{1/} Cooking Darkening	Chip ^{2/} Color	Color ^{3/} French Fries	Total Solids
01-70	LaChipper x 1859	181.7	239.4	3.0	2.0	2.0	20.5
11-24	62-104 x A2-22-222	107.8	150.2	1.8	3.3	1.0	18.8
12-34	62-104 x A2-22-222	64.2	117.5	3.0	4.3	3.5	17.1
11-118	61-84 x 41-182	137.1	167.6	2.3	1.2	1.0	18.2
11-208	61-80 @	88.2	102.3	2.0	4.2	3.0	18.0
21-71	61-71 @	112.1	131.7	3.0	3.3	1.5	19.0
22-78	72-7 @	56.6	148.0	4.0	3.7	3.0	19.4
21-89	71-61 @	95.8	127.3	3.5	3.8	2.0	17.3
21-140	Superior x 1859	146.9	179.6	4.0	3.8	2.3	19.2
Red LaSoda	Triumph x Katahdan (Mutant)	230.7	296.0	2.3	4.2	2.5	18.0
LaChipper	Green Mt. x Cayuga	167.6	211.1	2.0	1.8	1.0	19.7
31-124	Minn. 1317 x 71-110	150.2	179.6	4.0	4.5	2.5	19.7

^{1/} After Cooking Darkening: Rated 1 (white) to 5 (gray)

^{2/} Chip Color: 1 (lightest) to 10 (darkest)

^{3/} Color of French Fries: Rated 0 (white) to 4 (dark)

Louisiana Table 6. Additional regional trial notes - 1976

Clones	Average Yield U.S. #1 (Cwt/A)	Total Average Yield (Cwt/A)	<u>1/</u> After Cooking Darkening	<u>2/</u> Chip Color	<u>3/</u> Color French Fries	Total Solids
01-70	115.3	140.4	3.0	2.0	2.0	20.5
11-24	129.5	162.1	1.8	3.3	1.0	18.8
11-118	122.9	165.4	2.3	1.2	1.0	18.2
ND 8891-3	171.9	207.8	2.5	3.3	1.5	16.7
ND 8913-4 Russ	44.6	69.6	2.5	4.8	3.0	19.7
ND 8751-16	76.2	100.1	1.3	3.8	1.5	20.3
Red Pontiac	200.2	220.9	2.8	5.7	3.0	17.1
Russet Burbank	119.7	178.4	2.5	5.7	2.0	20.3
Norland	84.9	119.7	4.0	3.3	1.0	18.2
Norchip	124.0	151.2	1.3	2.8	1.5	19.7
Wisc. 718	82.7	99.0	2.0	2.0	2.0	18.4
Wisc. 726	112.1	133.8	2.5	3.2	1.3	18.4
Wisc. 729 R	115.3	130.6	1.5	3.3	3.0	18.0
AK 25	108.8	142.5	4.5	5.7	2.0	18.8
AK 28	88.1	112.1	4.0	3.5	1.0	19.4
Red LaSoda	215.4	252.4	2.3	4.2	2.5	18.0
La Chipper	131.6	162.1	2.0	1.8	1.0	19.7

1/ After cooking darkening: Rated 1(white) to 5(gray)

2/ Chip color: 1(lightest) to 10(darkest)

3/ Color of french fries: Rated 0(white) to 4(dark)

Louisiana Table 7. Potato trial conducted at North Louisiana Experiment Station
-Calhoun, Louisiana in 1976

Line	Stand	Marketable			Culls	Total	Remarks
		1's	2's	Total			
Red LaSoda	73	328	51	379	16	395	
11-208	73	307	46	353	10	363	very nice
11-118	59	276	58	334	21	355	fairly nice
01-70	77	265	71	336	24	360	scab, rough
La Chipper	53	228	32	260	10	270	
11-24	68	214	47	261	15	276	some scab
21-140	69	208	26	234	10	244	nice
12-34	57	168	49	217	23	240	
22-78	70	132	106	238	55	293	late
21-89	32	88	33	121	20	141	scab
LSD .05		79					

Fertilizer applied February 13 at the rate of 1,000 lbs of 8-24-24 per acre, seed cut February 13, planted February 16, 12" apart on 40" rows, 20 ft. plots replicated four times, top-dressed March 30 with 200 lbs. of ammonium nitrate per acre. Harvested June 3.

Louisiana Table 8. Potato test conducted at
Plaquemines Parish Experiment Station-1976

Clone	Average Yield U.S. #1 (Cwt/A)	Total Average Yield (Cwt/A)	After ^{1/} Cooking Darkening	Chip ^{2/} Color	Total Solids
1. Red LaSoda	256.8	289.4	2.3	5.5	18.4
2. 12-34	128.4	195.9	2.0	3.3	19.4
3. LaChipper	211.1	249.2	1.8	3.0	19.7
4. 01-70	167.6	215.5	2.0	3.2	19.7
5. 11-24	138.2	175.2	3.0	2.7	19.7
6. 12-34	116.5	183.9	2.0	5.7	18.0
7. 11-118	142.6	173.0	-	-	--
8. 11-208	94.7	153.4	1.8	2.7	18.4
9. 21-71	121.9	137.1	2.5	4.2	18.0
10. 22-78	89.3	164.3	2.5	4.0	20.7
11. 21-89	58.8	105.6	2.5	3.8	18.0
12. 21-140	70.8	91.4	3.5	3.7	19.4

^{1/} After Cooking Darkening: Rated 1 (white) to 5 (gray)

^{2/} Chip Color: 1 (lightest) to 10 (darkest)

MAINE

S. S. Leach, Raymon E. Webb and David Wilson

Resistance to Fusarium Tuber Rot (*Fusarium roseum* 'Sambucinum'). Inoculum for this test was grown on potato dextrose agar. Spores were washed from seven day old cultures and adjusted to 5000 per ml. The tubers of the test clones were inoculated with a hypodermic syringe at the bud and stem ends. The inoculum (100 spores) was injected into the tubers 7 mm below the tuber surface. The inoculated tubers were stored in a controlled environment room maintained at 55° F (13° C) and 95 percent relative humidity for 21 days. At the end of the storage period the tubers were removed and scored for tuber rot development and amount of sprouting. The degree of rot in a tuber was determined by cutting through the inoculation sites and measuring the length and width of the decayed area. The average rating for the susceptible check Russet Burbank was 13.20. The average for the resistant variety Hudson was 8.90. No pedigree appeared to be immune to tuber rot, but B7200-33 and B7783-6, with indices of 1.95 and 2.50, respectively, are very close. Only B7645-12 of those tested for the second year did not show resistance comparable or higher than Hudson. Of the new clones tested this year 13 showed higher resistance to tuber rot than Hudson. Line B7861-2 not only is tuber rot resistant, but also is slow in sprouting, as it is the only pedigree tested which did not show any sprout growth after 21 days stored at 55° F (13° C). (Table 1)

Maine Table 1. Varieties and pedigrees tested in Fusarium tuber rot resistance sprouting trials -- 1976-1977

<u>Variety</u>	<u>Fusarium Rating</u> ^{1/}	<u>Sprout Growth</u> ^{2/}
Atlantic	16.75	5
Cobbler	9.40	3
Hudson	8.90	2
Katahdin	14.00	2
Kennebec	18.95	2
Monona	18.10	4
Norchip	8.30	4
Norgold Russet	14.95	5
Superior	12.15	5
Russet Burbank	13.20	2

Repeat clones from 1975

<u>Pedigree</u>	<u>Fusarium Rating</u>	<u>Sprout Growth</u>
B6987-57	5.60	2
B7583-6	6.30	2
B7607-3	4.90	2
B7645-12	12.00	2
B7839-7	9.20	3
B7861-2	6.10	1
B7939-4	4.75	2
B7957-5	7.05	2

New Clones - 1976

<u>Pedigree</u>	<u>Fusarium Rating</u>	<u>Sprout Growth</u>
B6987-131	12.55	5
B6987-136	8.35	5
B6987-145	11.45	4
B6987-148	5.80	5
B6987-162	8.00	5
B6987-184	9.20	5
B6987-224	8.50	5
B7024-6	7.95	3
B7152-3	13.65	3
B7200-33	1.95	5
B7552-3	14.30	2
B7595-7	4.75	3
B7608-4	8.85	3
B7629-1	23.60	2
B7636-32	13.35	2
B7637-9	17.85	2

<u>Pedigree</u>	<u>Fusarium Rating</u>	<u>Sprout Growth</u>
B7678-17	11.85	2
B7679-9	8.00	2
B7744-5	14.40	2
B7783-6	2.50	2
B7813-5	11.30	5
B7848-19	9.35	2
B7863-6	19.60	2
B7871-5	14.55	5
B7902-4	12.45	4
B7930-2	10.00	4
B8004-8	17.25	3
B8091-8	19.25	2
B8188-6	14.15	4
B8188-9	18.30	4
B8212-1	24.20	2
B8261-3	14.25	4
B8281-4	5.80	4
B8285-2	28.30	4
B8339-4	8.45	2
B8392-5	17.05	5
B8429-1	12.80	3
B8429-9	6.80	5
B8515-1	13.75	5
B8515-18	17.00	2
B8543-9	10.35	4
B8599-42	17.70	4

1/ Rating of one (1) equals no observable disease present.

2/ Score based on length of sprout growth. One (1) equals no sprouting; two (2) equals piping; three (3) equals sprouts one-quarter inch long; four (4) equals sprouts one-half inch long; five (5) equals sprouts one inch long or longer.

MAINE - 1976

Hugh J. Murphy and Thomas Gajewski

Cooperative variety trials were conducted during 1976 at Presque Isle, Grand Isle, and Newport, Maine. Soil and weather conditions at planting time were cold and extremely wet. During the growing season, July was about the only month with normal growing conditions. Harvesting weather was also wet and cold during 1976.

Plots at all test locations were single rows, 25 feet long and replicated six times per variety. Planting, killing, harvest dates, seedpiece spacing and fertilization used are presented in Maine Table 4.

Yields and specific gravities for varieties grown at all locations are presented in Maine Table 1. The ten highest yielding varieties considering all locations were: B7845-4, WC330-1, B6987-1, AF32-8, F67072, BR7093-23, Kennebec, CA40-7, AF25-18c, and B6529-12. The ten highest varieties in specific gravity were: AF186-2, CD130-7, B6965-10, B6986-137, B6987-184, Atlantic, BR7089-6, 47156, CD08-1, and CD138-1. Of the 104 varieties tested in Maine at one or more locations, 63 varieties had a specific gravity of 1.075 or higher; and 36 had specific gravities of 1.080 or higher which suggests that in Maine, 1976 was a fairly good year for production of potatoes reasonably high in dry matter.

Size determinations of tubers for two market size classes are presented in Maine Table 2. Several varieties of both the round and long types had low percentages of U.S. #1 (Size A) tubers - ($2\frac{1}{2}$ to 4 inches) even in a year when moisture was not a limiting production factor.

Results of the first chipping and french fry color tests are presented in Maine Table 3. Many varieties at Grand Isle and Presque Isle had very good chip colors even though harvested after soil temperatures were very cool. At Newport, however, very few varieties had acceptable chip color (7.0 or less) in 1976. French fries were made from all varieties grown at Presque Isle. Seventy-one of the 103 varieties tested had satisfactory french fry color (3.0 or less). Only 52 of the 103 varieties used for french fry determinations had satisfactory (ratings lower than 1.2) french fry texture.

Complete details of the Maine cooperative variety trials are presented in the Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Vermont, and West Virginia Potato Variety Trials for 1976. This publication is available from Public Information and Central Services, University of Maine; Orono, Maine 04473.

Maine Table 1. Yield and specific gravity of potato varieties grown at Grand Isle, Presque Isle, and Newport, Maine - 1976.

Variety	Grand Isle		Presque Isle		Newport	
	Yield Cwt./A.	Specific Gravity	Yield Cwt./A.	Specific Gravity	Yield Cwt./A.	Specific Gravity
Atlantic	359	1.088	360	1.092	369	1.084
Belleisle	311	1.085	285	1.081		
Bison	360	1.062	287	1.068		
Cobbler	353	1.069	309	1.074		
Katahdin	353	1.077	385	1.073		
Kennebec	367	1.076	388	1.079	372	1.064
Monona					328	1.065
Norchip					358	1.067
Penn 71					367	1.066
Russet Burbank			335	1.092		
Shurchip					319	1.061
AF11-12c			308	1.075		
AF17-18c	289	1.062				
AF24-33c	313	1.077	297	1.090		
AF25-18c	392	1.068	358	1.077		
AF32-8	401	1.061	376	1.072		
AF40-9c	396	1.066	289	1.077		
AF41-2	332	1.066	314	1.072	389	1.066
AF84-4	371	1.076	306	1.079		
AF186-2	344	1.086	344	1.097		
AF193-4	291	1.075	290	1.077		
B6503-2	318	1.072	324	1.083	268	1.078
B6529-12	405	1.068	384	1.074	333	1.061
B6965-10	300	1.090	310	1.096	257	1.081
B6986-26	330	1.078	364	1.081	365	1.076
B6986-137	272	1.084	300	1.094		
B6987-1	437	1.077	344	1.088		
B6987-2	365	1.072	325	1.076		
B6987-29	315	1.084	306	1.080	354	1.079
B6987-184	263	1.089	262	1.088	355	1.088
B7008-3	307	1.075	271	1.077		
B7024-6	293	1.082	290	1.089		
B7033-33	285	1.082	350	1.085		
B7147-8			265	1.088		
B7153-29	348	1.067	337	1.075		
B7163-14	378	1.060	315	1.063		
B7167-2	274	1.081	263	1.085	264	1.076
B7196-74			296	1.074	282	1.063
B7583-6			339	1.089		
B7629-1	358	1.069	300	1.071		
B7669-2	257	1.062	295	1.064		
B7684-6			328	1.086		
B7732-2			332	1.076		
B7783-6			314	1.082		
B7802-2	363	1.068	363	1.073		

Maine Table 1 - continued.

Variety	Grand Isle		Presque Isle		Newport	
	Yield Cwt./A.	Specific Gravity	Yield Cwt./A.	Specific Gravity	Yield Cwt./A.	Specific Gravity
B7813-5			296	1.080		
B7845-4	412	1.076	389	1.075		
B7845-10	360	1.071	365	1.077		
B7845-19	300	1.072	333	1.079		
B7845-23	223	1.081	270	1.084	217	1.072
B7845-29			361	1.079		
B7848-2	283	1.080	359	1.084		
B7859-2	332	1.076	340	1.082		
B7861-2	259	1.074	224	1.068		
B7863-5			291	1.068		
B7929-11			266	1.080		
B7978-1			282	1.070		
B8086-3			361	1.076		
B8125-5			325	1.077		
B8148-4	328	1.067	374	1.079		
BR6316-5	409	1.081	372	1.091	340	1.075
BR6862-2	353	1.080	330	1.085		
BR6863-3	292	1.071	291	1.079	291	1.076
BR6863-5	284	1.077	305	1.081		
BR6864-9	388	1.069	355	1.079		
BR7088-18	366	1.079	325	1.091	328	1.073
BR7089-6	303	1.086	291	1.088		
BR7090-17	348	1.077	354	1.084	287	1.069
BR7093-5	287	1.075	316	1.074		
BR7093-20					312	1.071
BR7093-23	402	1.082	356	1.075		
BR7093-42	306	1.072	276	1.069	287	1.065
BR7093-48	305	1.074	281	1.066	356	1.066
BR7103-1	358	1.071	357	1.077		
BR7104-10	365	1.063	288	1.076	379	1.064
BR7108-1	389	1.075	350	1.086	312	1.074
C7232-6A	270	1.067	243	1.073		
CA02-7	371	1.078	299	1.077	266	1.074
CA23-6	333	1.081	294	1.079		
CA28-2			321	1.081		
CA40-7	409	1.067	342	1.072		
CA46-11	334	1.075	338	1.076	279	1.068
CA55-24	358	1.076	348	1.087		
CC06-12	298	1.075	317	1.073		
CC17-8A	219	1.071	215	1.074		
CC26-1A	321	1.076	307	1.079		
CD08-21			303	1.086		
CD08-29	292	1.069	376	1.088		
CD08-30	299	1.075	283	1.076	310	1.079
CD12-18	332	1.077	367	1.086		
CD23-1	336	1.073	322	1.087		

Maine Table 1 - continued.

Variety	Grand Isle		Presque Isle		Newport	
	Yield Cwt./A.	Specific Gravity	Yield Cwt./A.	Specific Gravity	Yield Cwt./A.	Specific Gravity
CD34-2	408	1.080	333	1.088		
CD51-4	259	1.081	253	1.080		
CD100-6			297	1.078		
CD124-1			281	1.081		
CD130-7			338	1.090		
CD138-2			238	1.085		
CD138-4			328	1.076		
CD139-9	338	1.074	249	1.082	290	1.076
F61025	311	1.085	277	1.084	258	1.075
F6208	314	1.084	341	1.083		
F67072			382	1.073		
WC330-1			392	1.080		
47156	281	1.084	255	1.089		
Bayes L.S.D. (0.05)	44	0.004	40	0.003	43	0.003

Maine Table 2. Percentage of yield between 1-7/8 and 4 inches in diameter for varieties grown at Grand Isle, Presque Isle, and Newport, Maine - 1976.

Variety	Grand Isle		Presque Isle		Newport	
	1-7/8	2-1/2	1-7/8	2-1/2	1-7/8	2-1/2
	to 4 inches	to 4 inches	to 4 inches	to 4 inches	to 4 inches	to 4 inches
Atlantic	96.2	85.2	97.3	83.9	93.8	84.5
Belleisle	95.9	79.2	97.6	82.4		
Bison	94.8	72.7	95.1	76.7		
Cobbler	93.8	73.7	93.5	78.4		
Katahdin	95.8	79.3	98.0	90.4		
Kennebec	94.4	83.2	97.2	89.4	95.5	86.8
Monona					95.5	86.4
Norchip					96.0	82.8
Penn 71					91.4	85.2
Russet Burbank			65.1% 4 - 10 oz.			
Shurchip					96.0	85.8
AF11-12c			58.4% 4 - 10 oz.			
AF17-18c	93.3	73.5				
AF24-33c	94.9	74.5	96.3	80.0		
AF25-18c	94.4	7-.1	97.3	80.1		
AF32-8	93.6	71.4	96.8	82.5		
AF40-9c	95.4	83.4	98.2	89.6		
AF41-2	95.3	75.3	95.0	78.1	97.0	84.9
AF84-4	97.1	90.3	98.5	90.7		
AF186-2	94.0	65.6	96.5	74.2		
AF193-4	92.0	65.0	96.6	77.1		
B6503-2	97.1	79.0	96.0	83.7	97.9	85.4
B6529-12	88.8	81.4	95.8	90.0	86.0	77.5
B6965-10	94.5	73.8	95.9	75.4	95.6	85.0
B6986-26	94.4	83.3	97.2	89.3	86.3	80.4
B6986-137			92.9	66.6		
B6987-1	93.4	79.6	96.8	84.4		
B6987-2			95.3	84.3		
B6987-29	96.5	84.8	96.6	83.3	93.5	85.6
B6987-184	92.8	66.7	96.0	74.5	96.8	86.1
B7008-3	94.5	82.2	96.2	85.6		
B7024-6	94.8	75.0	96.0	77.1		
B7033-33	95.9	80.1	92.9	86.2		
B7147-8			67.6% 4 - 10 oz.			
B7153-29	95.1	79.6	96.1	77.1		
B7163-14	96.5	82.5	98.1	83.8		
B7167-2	93.5	67.2	96.8	82.7	96.1	77.7
B7196-74			63.2% 4 - 10 oz.		96.4	79.8
B7583-6			59.0% 4 - 10 oz.			
B7629-1	96.4	86.6	98.0	88.4		
B7669-2	93.2	71.6	97.6	81.8		
B7684-6			99.0	93.5		
B7732-2			98.4	93.4		

Maine Table 2 - continued.

Variety	Grand Isle		Presque Isle		Newport	
	1-7/8 to 4 inches	2-1/2 to 4 inches	1-7/8 to 4 inches	2-1/2 to 4 inches	1-7/8 to 4 inches	2-1/2 to 4 inches
B7783-6			96.2	88.6		
B7802-2	96.2	84.9	95.8	88.0		
B7813-5			64.0% 4 - 10 oz.			
B7845-4	91.3	63.3	93.3	62.5		
B7845-10	93.6	64.3	94.4	69.6		
B7845-19	90.1	58.6	92.9	62.8		
B7845-23	93.6	55.0	96.2	72.0	95.0	69.0
B7845-29			95.7	69.9		
B7848-2	90.7	58.0	95.1	69.2		
B7859-2	93.2	68.7	96.0	68.2		
B7861-2	92.0	54.2	88.4	36.7		
B7863-5			96.9	81.7		
B7929-11			94.5	77.6		
B7978-1			98.3	84.5		
B8086-3			95.1	86.2		
B8125-5			97.0	80.2		
B8148-4	94.9	76.3	98.4	87.6		
BR6316-5	94.6	76.9	96.8	89.4	98.0	86.8
BR6862-2	96.4	86.6	97.0	89.6		
BR6863-3	96.0	85.9	96.9	88.3	92.3	86.5
BR6863-5	91.1	80.7	92.9	72.8		
BR6864-9	94.9	76.9	97.7	84.3		
BR7088-18	95.3	82.5	97.9	86.7	93.2	84.3
BR7089-6	97.8	90.0	97.0	80.6		
BR7090-17	93.1	73.4	97.3	84.5	96.1	84.7
BR7093-5	97.9	88.6	98.0	92.3		
BR7093-20					88.4	82.0
BR7093-23	94.7	75.1	96.5	81.1		
BR7093-42	95.8	89.8	95.3	90.7	92.3	88.1
BR7093-48	96.1	85.0	96.2	88.6	89.2	83.5
BR7103-1	96.2	79.6	98.1	87.0		
BR7104-10	91.4	76.6	94.2	78.4	94.6	83.9
BR7108-1	95.2	77.7	98.2	84.8	91.3	78.7
C7232-6A	91.8	67.5	92.3	70.3		
CA02-7	93.8	74.4	96.5	81.2	97.4	75.9
CA23-6	96.1	89.7	95.9	89.4		
CA28-2			41.2% 4 - 10 oz.			
CA40-7	94.8	83.0	97.6	84.3		
CA46-11	93.8	73.2	97.8	82.2	97.6	84.8
CA55-24	95.9	82.3	96.7	90.0		
CC06-12	95.1	73.4	98.2	84.4		
CC17-8A	93.1	75.6	95.7	79.6		
CC26-1A	90.6	68.1	96.8	81.0		
CD08-21			52.8% 4 - 10 oz.			

Maine Table 2 - continued.

Variety	Grand Isle		Presque Isle		Newport	
	1-7/8	2-1/2	1-7/8	2-/12	1-7/8	2-1/2
	to 4	to 4	to 4	to 4	to 4	to 4
	inches	inches	inches	inches	inches	inches
CD08-29	92.9	78.8	98.1	89.2		
CD08-30	95.9	80.4	97.5	82.1	95.2	88.5
CD12-18	94.4	73.3	94.6	80.9		
CD23-1	95.7	78.7	97.3	86.9		
CD34-2	93.1	71.9	95.1	76.4		
CD51-4	94.8	79.3	96.9	82.8		
CD100-6			97.7	88.2		
CD124-1			98.0	90.9		
CD130-7			57.1% 4 - 10 oz.			
CD138-2			97.5	79.3		
CD138-4			54.6% 4 - 10 oz.			
CD139-9	96.4	79.7	97.0	80.4	97.7	83.5
F61025	93.7	78.0	98.5	91.1	97.8	85.2
F6208	94.8	78.4	97.3	88.8		
F67072			95.9	91.0		
WC330-1			63.4% 4 - 10 oz.			
47156	93.8	77.9	98.5	89.1		

Maine Table 3. Chip color, french fry color and texture indices for potato varieties grown at Presque Isle, Grand Isle, and Newport, Maine - 1976.

Variety	Presque Isle			Grand Isle	Newport
	Chip Color ¹	French fry Color ²	Texture ³	Chip Color ¹	Chip Color ¹
Atlantic	5.6	2.1	1.0	7.6	7.8
Belleisle	7.5	2.2	2.2	9.0	
Bison	7.7	2.8	1.1	8.7	
Cobbler	8.5	3.3	1.1	8.8	
Katahdin	7.7	2.5	1.8	9.4	
Kennebec	6.1	2.6	1.0	8.4	
Monona					7.3
Norchip					7.1
Penn 71					8.2
Russet Burbank	9.0	3.9	1.5		
Shurchip					8.3
AF11-12c	8.7	3.4	2.2		
AF17-18c				9.1	
AF24-33c	6.4	2.4	1.0	6.9	
AF25-18c	5.9	2.1	1.4	9.0	
AF32-8	8.9	3.5	1.2	8.5	
AF40-9c	6.3	2.2	1.1	7.1	
AF41-2	7.7	2.9	1.1	8.8	8.4
AF84-4	6.1	1.8	1.5	8.0	
AF186-2	6.3	1.9	1.1	6.8	
AF193-4	4.7	2.0	1.2	8.0	
B6503-2	5.5	1.6	1.2	6.6	6.5
B6529-12	6.1	2.4	1.2	7.8	8.1
B6965-10	4.2	1.4	1.1	6.6	7.4
B6986-26	6.8	1.9	1.1	7.6	8.3
B6986-137	4.2	1.2	1.1	6.5	
B6987-1	7.9	2.8	1.1	8.3	
B6987-2	7.5	2.9	1.0	8.6	
B6987-29	6.1	1.2	1.7	7.2	7.5
B6987-184	6.2	1.5	1.9	8.3	8.0
B7008-3	8.1	2.8	1.0	8.4	
B7024-6	6.6	2.4	1.0	6.7	
B7033-33	5.9	2.7	1.1	8.2	
B7147-8	8.1	2.9	2.2		
B7153-29	6.0	1.7	2.2	6.8	
B7163-14	6.7	2.1	2.3	8.7	
B7167-2	6.1	2.0	1.3	6.1	7.0
B7196-74	9.0	4.5	2.4	9.0	10.0
B7583-6	8.5	3.8	1.9		
B7629-1	7.5	3.1	1.6	9.7	
B7669-2	7.9	2.6	2.0		
B7684-6	7.8	2.8	1.9	8.9	
B7732-2	9.3	4.6	1.9	8.9	
B7783-6	9.6	4.4	2.1		
B7802-2	6.8	3.0	1.0	8.9	

Maine Table 3 - continued.

Variety	Presque Isle			Grand Isle	Newport
	Chip Color ¹	French fry Color ²	Texture ³	Chip Color ¹	Chip Color ¹
B7813-5	8.2	3.2	1.9		
B7845-4	8.6	3.8	2.6	10.0	
B7845-10	6.8	2.8	1.0	8.7	
B7845-19	7.0	2.3	1.9	8.7	
B7845-23	8.3	3.5	1.1	8.7	8.9
B7845-29	9.7	4.5	2.4		
B7848-2	7.8	3.9	1.3	8.7	
B7859-2	6.9	2.0	2.2	8.1	
B7861-2	6.8	2.1	1.4	9.5	
B7863-5	7.6	2.3	1.6		
B7929-11	7.2	2.7	1.3		
B7978-1	6.9	2.2	2.2		
B8086-3	8.0	2.5	1.7		
B8125-5	7.0	2.4	1.2		
B8148-4	7.5	3.1	1.2	8.4	
BR6316-5	7.8	2.9	1.1		8.1
BR6862-2	7.3	2.8	1.3	7.7	
BR6863-3	6.7	1.9	1.1	6.7	7.8
BR6863-5	6.7	1.8	1.0	8.0	
BR6864-9	8.1	3.0	1.0	8.6	
BR7088-18	7.2	2.6	1.2	7.7	7.9
BR7089-6	5.3	2.5	1.2	8.3	
BR7090-17	6.8	1.8	1.0	6.9	7.9
BR7093-5	5.9	1.4	1.2	7.4	
BR7093-20					6.9
BR7093-23	6.8	2.1	1.4	8.2	
BR7093-42	7.0	2.0	1.2	7.3	7.1
BR7093-48	4.3	1.2	1.2	6.8	8.4
BR7103-1	7.3	3.4	1.1	8.7	
BR7104-10	8.4	2.7	1.0	8.9	8.9
BR7108-1	7.1	2.8	1.0	7.9	8.2
C7232-6A	6.8	2.7	1.2	8.1	
CA02-7	6.8	2.1	1.5	8.7	8.5
CA23-6	6.9			9.1	
CA28-2	9.3	3.6	2.0		
CA40-7	7.3	2.1	1.6	9.1	
CA46-11	5.6	2.3	1.0	7.9	7.8
CA55-24	7.9	2.3	1.3	7.7	
CC06-12	8.3	3.3	2.1	8.7	
CC17-8A	5.5	2.2	1.1	7.1	
CC26-1A	7.5	2.9	1.1	7.9	
CD08-21	8.5	3.4	1.5		
CD08-29	7.9	1.7	1.0	7.9	
CD08-30	6.8	2.2	1.1	8.1	8.3
CD12-18	6.9	1.8	1.0	7.2	

Maine Table 3 - continued.

Variety	Presque Isle			Grand Isle	Newport
	Chip Color ¹	French fry Color ²	Texture ³	Chip Color ¹	Chip Color ¹
CD23-1	7.5	2.3	1.0	7.9	
CD34-2	8.0	2.8	1.2	8.6	
CD51-4	7.5	1.9	1.4	8.1	
CD100-6	8.9	3.6	1.7		
CD124-1	9.2	3.8	2.0		
CD130-7	8.4	2.7	1.9		
CD138-2	9.3	3.9	1.6		
CD138-4	9.2	4.6	2.2		
CD139-9	6.9	2.4	1.2	6.9	7.2
F61025	5.6	2.9	1.2	8.6	8.6
F6208	8.1	3.3	1.2	8.5	
F67072	6.3	3.1	1.4		
WC330-1	8.9	3.6	2.3		
47156	6.7	2.8	1.1	8.9	
Bayes L.S.D. (0.05)	0.7	0.4	0.2	0.8	0.6

¹Chips with lower index numbers are lighter in color. (PCII color reference chart 1206-U).

²French fries with lower index numbers are lighter in color. (USDA color standards).

³Lower texture indices indicate mealier texture.

Maine Table 4. Pertinent information about the Maine Cooperative Potato Variety Trials - 1976.

Location and Maturity Season	Date Planted	Date Killed	Date Harvested	Fertilization	Seedpiece Spacing
<u>Presque Isle</u>					
Early varieties	May 11	August 18	September 3	135-135-135	1/
Medium varieties	May 12	September 2	September 13	135-135-135	1/
Med.-Late varieties	May 14	September 10	September 24	135-135-135	1/
Late varieties	May 14	September 16	October 6	150-150-150	1/
Russet and Long type	May 14	September 23	October 12	160-160-160	2/
<u>Grand Isle</u>					
Early varieties	June 3	September 8	September 17	150-150-150	1/
Medium varieties	June 3	September 17	September 28	150-150-150	1/
Med.-Late varieties	June 3	September 23	October 7	150-150-150	1/
Late varieties	June 3	September 23	October 7	150-150-150	1/
<u>Newport</u>					
All varieties	June 2	September 20	October 1	160-160-160	3/

¹Seedpieces of all varieties spaced 8 inches apart.

²Seedpieces of Russet Burbank spaced 16 inches apart; seedpieces of all other varieties spaced 12 inches apart.

³Seedpieces of B7196-74 spaced 12 inches apart; seedpieces of all other varieties spaced 8 inches apart.

MISSISSIPPI

C. P. Hegwood, Jr.

Irish Potato Variety Trials

Location and Procedure. The 1976 Irish Potato Trials were conducted at the Delta Branch of the Mississippi Agricultural and Forestry Experiment Station. The Delta Branch is located in the Yazoo-Mississippi Delta area at Stoneville, Mississippi. In a randomized complete block design with four replications, two cultivars and seven line selections were evaluated. Plot dimensions were 3.3 x 25 feet. Soil type was a Bosket fine sandy loam. Fertilizers (ammonium nitrate and 8-24-24) were applied in band at the rates of 300 and 200 lbs/A, respectively. Terrachlor Super X was applied at the rate of 5 gal/A and incorporated into the seedbeds. For chemical weed control Sencor was used at the rate of 1 lb/A.

Climatic Conditions. The growing season was from March 2 to June 22, 1976. No frost or freezing temperatures were experienced in March and the total rainfall for the month was 6.43 inches. Precipitation for April, May, and June was 1.00, 4.24, and 6.28 inches, respectively. The mean temperature (66.4° F) for May was the coldest ever recorded and was 6° F below normal.

Mississippi Table 1. Yield and quality data for two cultivars and seven line selections.

Entry Identification	Yields/A cwt			Culls	Specific Gravity ^{1/}
	Total	A	B		
Kennebec	278.5	269.3	9.2	12.3	1.069
B 6969-2	207.5	200.6	6.9	2.1	1.065
B 6987-29	282.8	279.2	3.6	2.1	1.076
B 6987-43	175.3	173.6	1.7	1.3	1.079
B 6987-56	275.9	269.3	6.6	0.9	1.082
B 7139-4	246.9	239.4	7.5	4.1	1.074
B 7151-4	264.5	259.2	5.3	2.6	1.081
B 7200-26	227.3	223.7	3.6	4.1	1.071
La Chipper	273.7	264.9	8.8	4.1	1.073

^{1/} Specific gravity was determined with a potato hydrometer.

NEBRASKA

R. B. O'Keefe, Louis Daigger, Robert Wilson, Kenneth Frank

Development of Processing Varieties

Forty-two advanced selections made from both standard and inter-specific hybrid populations were included in yield and disease screening tests in Nebraska and Arizona. Chip quality and storage data were obtained. An additional 82 selections from five Nebraska parents crossed with 32 new variety releases from foreign countries were also included in the tests. Three white chipping selections (A147.1, 17.72-5, 17.76-1), two bright reds that do not over-brown (A143.70-2, A212.69-1), and two long russets (Nebraska 498, A102.71-2) have been identified for seed increase and commercial testing in 1977 and 1978.

An additional 31 russet clones were evaluated in Nebraska and Texas (with Dr. Creighton Miller). Results are available in the Texas report.

Selection, Screening and Winter Indexing of Seed Stocks

Winter indexing of seed stocks in the breeding program was transferred from Alabama to Arizona in 1974. Five to 10 hills (tuber index) are planted with the cooperation of Dr. Paul Bessey, Department of Horticulture, University of Arizona and Dr. D. Pew of the Mesa Experiment Station. Some 511 named varieties and advanced clones were indexed in 1976. In addition to obtaining disease readings, yield and chip quality (specific gravity and chip color) determinations were made for the 42 most promising varieties and selections. The plots were planted on January 26 and harvested June 7, 1976. Leafroll was the predominate virus disease in seed stocks (0.15%) and a trace of spindle tuber was noted (confined to five selections).

Twenty-two clones were identified as being equal or superior to Kennebec in yield, specific gravity and chip quality and will be included in replicated trials in Nebraska and Arizona in 1977 (Nebraska Tables 1 and 2).

Two russets were superior to Norgold and equal to Centennial in yield and quality. Five bright red clones were equal or superior to Red LaSoda.

Nebraska Table 1. Replicated trial at Mesa, Arizona in 1976.^{1/}

<u>Selection</u> <u>Whites</u>	<u>Yield</u> (cwt/acre)	<u>Specific</u> <u>Gravity</u>	<u>Chip Color</u> (PCII)	<u>Comments</u>
Kennebec	163	1.065	2.0	Oval, irregular
54.66-1	156	1.069	2.5	Round, smooth
17.67-1 ^{2/}	308	1.072	2.0	Vigor + Oval good size
A219.70-3	172	1.076	2.0	Scaly russet
A149.70-1	196	1.065	2.0	Oval, flat, good size
A147.71-1 ^{2/}	191	1.066	2.0	Vigor + round, smooth
Alaska ^{2/}	160	1.102	2.0	Heat tolerant, round, smooth
37.68-19-70	^{2/} 330	1.070	2.0	Vigor + oval flat
17.72-5				
A5.72-1	210	1.070	1.5V	Oval, heat necrosis
<u>Russets</u> ^{2/}				
Norgold	73	-----	----	Small
R. Burbank	129	-----	----	Small, rough
Centennial	165	1.063	----	Long, heat sprout
WC285-18	196	1.086	2.0	Scaly, oval russet
58.66-1	221	1.059	3.0V	Scaly, heat sprout
Nebraska 498 ^{2/}	205	1.069	----	Long, oval, heat sprout
<u>Reds</u> ^{2/}				
Norland	85	-----	----	Small, overbrown
A212.69-1 ^{2/}	187	1.059	----	Vigor + oval, smooth
A143.70-2 ^{2/}	200	1.078	----	Vigor, oval, size
Nebraska 118	210	1.087	----	Round, size

Planted: January 26; harvested June 7.

^{1/} Two replicates of five-hills.

^{2/} Best selections in the 1975 five-hill plots.

Nebraska Table 2. Best Selections in the 5-Hill Plots in Arizona
in 1976.

<u>Selection</u> <u>Whites</u>	<u>Yield</u> (cwt/acre)	<u>Specific</u> <u>Gravity</u>	<u>Chip Color</u> (PCII)	<u>Comments</u>
Kennebec	145	1.077	2.0	
48.60-45	228	1.076	3.0	Heat necrosis
D17.63-1	174	1.079	2.0	Vigor +
11.67-1	145	1.067	2.0	
17.67-1	160	1.068	3.0	Early, vigor
22.67-1	163	1.074	2.5	Vigor
Nebraska 29-1	221	1.063	3.0	Vigor, bloom
A158.70-2	287	1.063	3.0	Vigor
A176.70-2	163	1.066	2.0	Heat, necrosis scaly
A147.71-1	152	1.062	3.5	
Wischip	171	1.076	---	Small
37S.72-2	210	1.067	---	Small, rough
90S.72-3	152	1.069	2.0	
9.72-2	189	1.071	---	Small
25.72-1	149	1.065	3.0	
A26.72-2	326	1.088	2.0	Vigor
A76.72-2	185	1.070	3.0	Heat necrosis
A86.72-3	185	1.074	---	
A110.72-1	214	1.080	---	
P19.72-1	171	1.109	---	
Nebraska 108	200	1.062	2.5	
P121.72-3	203	1.071	---	
Nebraska S1-3	225	1.061	3.0	
<u>Russets</u>				
WC285-18	108	1.062	---	
Belts. 16	94	1.090	---	
A102.71-2	181	1.064	---	
<u>Reds</u>				
Bounty	127	1.071	---	
A3.62-26	145	1.103	---	
A212.69-1	160	1.062	---	Vigor
A143.70-2	200	1.082	---	
A219.70-2	116	1.080	---	
A77.72-1	145	1.067	---	

Cultural Studies

In cooperation with Professor Louis Daigger of the Panhandle Station, applications of fertilizers to commercial potato fields based on soil analyses and recommendations from five laboratories were studied at two locations in eastern and two in western Nebraska in 1975. The results as reported by Mr. Daigger are attached. As noted, fertilizer costs ranged from a low of \$18.00 to \$27.00 up to a high of \$71.00 to \$103.00 per acre for a given location. No significant differences were found in either yields or grade and chipping quality among the fertilizer treatments at a given location (Nebraska Table 3).

In cooperation with Dr. Robert Wilson of the Panhandle Station, herbicide observation and replicated trials were conducted at Gibbon and Alliance. Both preemergence and lay-by treatments were studied. The results are given in Nebraska Tables 4, 5 and 6.

As noted Sencor was generally the most effective chemical. Though differences did occur in yields as related to chemical treatments, they were not significant. No significant effects on chipping quality were noted.

Processing and Quality Studies

The North Central States potato trials have included 107 selections (and standard varieties) during the six year period 1970 through 1975. Nine to 11 locations have provided samples for measurement of 12 factors associated with potato yields and processing quality. The factors are yield, total solids, chip yield (lbs./cwt.), oil content of chips, total sugars, reducing sugars, chip color (PCII), Rd value and soluble protein.

The studies have been conducted to determine genotypic, environmental, and genotype - environmental interaction effects on yield and quality. The data have also provided information relative to correlations among quality factors. Heritability values (broad sense) have been determined for all factors (Nebraska Table 7). Heritability values have been used as weighting factors to calculate comparative selection indices for selecting genotypically superior clones included in the trials. The data have been summarized and the results are to be published in two manuscripts - namely, "Effects of genotype, environment and their interactions on potato quality" and "Development and use of selection indices for selecting superior potato clones".

Emphasis in 1976 was placed on the determination of genotypic, environmental and genotypic--environmental interaction effects on glycoalkaloid content of potatoes. The mean glycoalkaloid content for selections ranged from 2.341 to 14.081 mg./100g. (Nebraska Table 8). The highest value was obtained for Russet Burbank. Of the named varieties Red Pontiac was lowest with 2.993 mg./100g. followed by Norland (3.501) and Norchip (4.887).

The mean values for locations ranged from 2.73 mg./100g. in samples from Michigan to 10.983 mg./100g. in samples from North Dakota.

Nebraska Table 3. Total production and yield of U.S. #1's for treatments at four locations in Nebraska 1975.

<u>Laboratory</u>	<u>Fertilizer Cost/acre</u>	<u>Yields</u>	
		<u>Total cwt/acre</u>	<u>U.S. No. 1 cwt/acre</u>
		<u>Central City</u>	
A	\$ 88.45	272	202
B	92.00	306	228
C	74.80	314	238
D	71.80	249	186
E	47.40	318	232
F	18.90	313	246
		<u>Scottsbluff</u>	
A	\$ 102.67	461	392
B	77.14	499	428
C	94.85	516	434
D	84.49	481	416
E	55.50	501	435
F	20.25	473	406
		<u>Alliance</u>	
A	\$103.78	299	221
B	72.91	268	198
C	104.79	278	218
D	87.15	265	190
E	40.50	287	225
F	27.00	275	200
		<u>Gibbon</u>	
A	\$ 71.33	298	201
B	97.00	312	198
C	51.80	300	200
D	60.95	300	206
E	40.50	307	200
F	20.25	280	194

Nebraska Table 4. Lay-by herbicide treatments on potatoes at Gibbon, Nebraska 1975.

Treatment	Rate lbs/A	Weed Counts	Yield Cwt/A	US#1	Sort-out Percent	Under 1-7/8"	Tuber Wt.(oz)	Specific Gravity	PCI Color
Randox 4EC	4.0	32+12	231	65	5	30	4.9	1.066	5.0
Randox 20G	4.0	30+10	265	72	3	25	4.9	1.070	4.0
Dacthal 600	7.5	7+2	258	69	13	17	4.6	1.064	5.0
Dacthal W-75	7.5	7+3	189	73	5	22	4.7	1.066	7.0
Sencor	0.75	2+0	193	50	5	44	4.2	1.066	5.0
Check		82+53	222	52	10	37	4.6	1.067	6.0

Planted: April 18, 1975, Norland Variety, Laomay Sand Soil.

Herbicide Applied: June 10, 1975, 3 rows (3'X75').

Harvested: July 28, 1975, 1 row (3'X75')

Weed Counts: July 16, 1975 Broadleaf + Grasses in single row 75' long
Carpetweed, Lambsquarter, Pigweed, Sandbur, Yellow Foxtail, Ground Cherry,
Yellow Nutsedge, Annual Bluegrass.

Nebraska Table 5. Lay-by herbicide treatments on potatoes at the Northwest Agricultural Laboratory, Alliance, Nebraska 1975.

Treatment	Rate lbs/A	Yield Cwt/A	Percent US#1	Sort-outs	Under 1-7/8"	Specific Gravity	PCI Color
Weedy check		348	79	12	8	1.078	4.0
Cobex (2EC)	0.5	306	87	5	7	1.079	4.0
Cobex + Sencor	0.3 + 1.0	286	84	4	11	1.080	4.5
Dacthal (6EC)	7.5	198	69	16	15	1.084	3.5
Eptam (7EC)	3.0	278	83	8	9	1.080	3.5
Eptam + Treflan (4EC)	3.0 + 0.5	279	71	5	24	1.085	4.5
Maloran (50% WP)	2.0	247	73	15	12	1.078	4.0
Maloran + Cobex	2.0 + 0.3	229	75	10	15	1.076	4.0
Lasso (4EC)	3.0	230	82	8	9	1.078	4.0
Sencor (50% WP)	1.0	260	79	11	10	1.075	4.0
Sencor + Maloran	0.5 + 1.0	244	80	6	14	1.077	3.5

Planted: May 23, 1975 - Variety: HiPlains.
Spacing: 9.6" X 38" (50ft. plots); data are averages of 2 replicates.
Harvested: September 18, 1975.

Nebraska 6. Pre-emergence herbicide treatments on potatoes, Alliance, Nebraska 1975.

Treatment	Rate lbs/A	Weed Weight (lbs)	Yield Cwt/A	US#1	Sort-out	Percent Under 1-7/8"	Stand Count	Specific Gravity	PCI Color
Eptam	3.0	145	177	27	67	6	26	1.081	3.0
Sencor 50W	1.0	12	225	20	72	7	25	1.087	4.0
Maloran 50W	2.0	72	135	33	58	9	23	1.083	3.0
Cobex 2EC	0.3	329	180	52	26	22	47	1.082	3.0
Radox 4EC	4.0	82	137	52	36	12	30	1.084	3.0
Dacthal 600	7.5	87	227	37	48	15	33	1.085	3.0
Sencor +	1.0	1	230	34	55	11	28	1.085	3.0
Cobex	+0.3	551							
Check	---		95	45	40	14	20	1.082	3.0

Planted: May 10, 1975, Norchip Variety.

Herbicide Applied: May 16, 1975, 4 rows (3'X75').

Harvested: September 17, 1975, 1 row (3'X75').

An additional two years of data will be obtained to determine genotypic, environmental and interaction effects and heritability values for glycoalkaloid content.

Genotypic effects accounted for 24% of the variation; environmental effects, 16%; genotype-environmental interaction, 59%; error=1%. A heritability value (broad sense) of 0.239 was obtained for glycoalkaloid content of potatoes.

Nebraska Table 7. Estimated heritability values estimated in the NCS potato trials 1970 to 1975.

<u>Factor</u>	<u>1970-74</u> ^{1/}	<u>1972-73</u> ^{2/}	<u>1974</u> ^{3/}
Yield	0.08	0.27	0.25
Total Solids	0.01	0.45	0.41
Chip Yield	0.17	0.22	0.12
Percent Oil	0	0.07	0
Total Sugars	0.40	0.42	0.12
Reducing Sugar	0.16	0.26	0.16
Chip Color PCII	0.51	0.29	0.18
Chip Color Rd	0.51	0.34	0.18
Sol. Protein	0.09	0.05	0

^{1/}Four years for 3 standard varieties and 6 locations.

^{2/}Two years for 7 selections and 10 locations.

^{3/}One year for 15 selections and 9 locations.

Nebraska Table 8. Glycoalkaloid content of potatoes in the NCS trials in 1975.

<u>Locations</u>	<u>Mean</u> (mg/100g)	<u>Range</u> (mg/100g)
North Dakota	10.983	2.301 - 56.364
Wisconsin	8.424	2.037 - 36.479
Kansas	6.427	2.095 - 14.775
Minnesota	6.172	2.037 - 26.090
South Dakota	5.428	1.978 - 20.406
Nebraska-West	4.703	1.802 - 22.635
Missouri	4.655	1.772 - 13.622
Nebraska-East	4.284	1.773 - 18.633
Michigan	2.732	1.802 - 4.848
LSD (.01)	0.735	
<u>Selections</u>		
Russet Burbank	14.081	2.157 - 56.364
Wisconsin 4858	12.310	2.216 - 36.479
Minnesota 4858	10.805	2.705 - 27.337
Alaska 5	8.453	2.217 - 18.267
Iowa 1111-2	7.842	2.216 - 22.635
Missouri 711-8	6.891	2.037 - 23.174
Wisconsin 726	6.815	2.109 - 15.608
Nebraska 42-1	6.788	2.149 - 15.047
Minnesota 5072	6.041	1.773 - 15.248
Wisconsin 729R	5.379	1.907 - 8.781
Norchip	4.887	2.095 - 15.512
North Dakota 8888-2	4.678	1.949 - 10.951
Louisiana 01-70	4.640	2.096 - 13.622
Minnesota 3866	3.912	1.802 - 14.775
North Dakota 8891-3	3.858	1.861 - 12.810
Norland	3.501	2.157 - 7.911
Nebraska 43.66-1	3.454	1.772 - 8.888
Louisiana 11-24	3.136	1.907 - 7.860
Red Pontiac	2.993	1.978 - 4.774
Louisiana 11-118	2.753	2.127 - 4.186
North Dakota 8947-2	2.341	1.802 - 2.902
LSD (.01)	0.493	
C.V.	10.20%	

The potato samples from the NCS trials were chipped when received after harvest (non-chilled), after storage for eight weeks at 38°F and then after reconditioning for six weeks at 60°F. As the color of chips at harvest time improved reducing sugar and non-reducing sugar contents were comparatively low after eight weeks of storage at 38°F. Consequently, the color of potato chips following cold storage was directly correlated with the color of chips produced from the same potato sample at harvest time (correlation coef.=0.29 to 0.44). Similarly light color potato chips at harvest time were associated with low reducing sugar (and non-reducing sugar) contents in potatoes following reconditioning at 60°F. The color of potato chips following reconditioning was therefore correlated with the color of chips produced at harvest time (correlation coef.=0.25 to 0.56). Consequently, it is feasible to use a standard fry test such as the Nebraska "mini'fry" and correlation data to predict chip color following storage periods at various temperatures. Color of chips as estimated either by using the PCII color (under standard light conditions) or as measured by Rd values or Agtron values can be used in the predictions. The PCII color values were highly correlated with Rd values as indicated by the correlation coefficient of 0.962.

A summarization of the correlation data for chip color and sugar contents of potatoes at harvest time for potato samples obtained from the summer and fall crop areas of Nebraska in 1973 are presented in Nebraska Table 9. The color of potato chips produced from the original samples were highly correlated with reducing sugar content but not with non-reducing sugar contents. After 38° storage for eight weeks the color of potato chips was highly correlated with the original non-reducing sugar (sucrose) content of potatoes harvested in the fall crop area but not from the summer crop area. There was no correlation between chip color following cold storage and the original reducing sugar content of potatoes at harvest time. After reconditioning for six weeks at 60°F. chip color was highly correlated with the original non-reducing sugar contents of potatoes at harvest time from both the summer and fall crop areas. Chip color was correlated with reducing sugar contents of potatoes at harvest in the fall crop area but not from the summer crop area. Therefore, non-reducing sugar content at harvest was a better indicator of chip color after storage than reducing sugar content.

The Nebraska data indicate the feasibility of utilizing the measurements of non-reducing contents at harvest time to predict long term chip color of a wide range of potato samples or varieties produced under similar environmental conditions.

The relationship of chip color to non-reducing sugar contents of specific varieties produced over a wide range of environments or locations was investigated. There was no relationship between non-reducing sugar contents at harvest time and the color of potato chips produced from samples of Norchip or Irish Cobbler over a wide range of environments. In other words, the non-reducing sugar contents of Irish Cobbler and Norchip samples from several locations could not be used to predict chip color following cold storage and reconditioning. However, the color of potato chips produced from

Red Pontiac samples following cold storage and reconditioning was directly correlated with non-reducing sugar contents of tubers at harvest time. Similarly when the data for all three varieties were combined, chip color following cold storage plus reconditioning was correlated with non-reducing sugar contents of samples at harvest time. The combined results of the study of many varieties grown in two separate environments (Nebraska) versus the study of specific varieties grown over a wide range of environments suggest that the variety and environment (location) interaction is high. That is, the effects of variations in environment are not the same or uniform over a wide range of varieties. Consequently, the use of the measurement of non-reducing sugars at harvest time to predict chip color following storage should be based on the development of correlation and regression data for specific varieties and individual locations.

Nebraska Table 9. Correlation coefficients for chip color and sugar contents of potatoes at harvest time in the Nebraska summer and fall crops.

Chip Color (Rd) (18 Varieties)	Reducing Sugar (%)		Non-reducing Sugar (%)	
	Summer	Fall	Summer	Fall
Original Samples	0.600**	0.650**	0.227	0.272
38°F. Storage for 8 weeks	0.291	0.138	0.050	0.822**
60°F. Reconditioning 6 weeks	0.096	0.366*	0.355*	0.588**

NEW JERSEY

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Approximately 40,000 seedling tubers were grown at the breeding farm at Perham, Maine, in 1976. Of these about 1700 hills were saved for replanting in 1977. From 1340 clones planted in the first clonal generation, 256 were saved for processing tests and possible replanting. In the second clonal generation planting of 126 clones, 31 were saved for processing tests and possible future replicated trials.

Data reported are from replicated trials in New Jersey, Ohio, and Maine. Experimental design was a RCB, usually with four replicates. Plot size was 25 hills, with hills spaced ten inches apart and three feet between rows. Planting dates, harvest dates, fertilization and cultural practices were similar to those practiced in the areas in which the trials were located. Unless otherwise stated, chip color indices are from tubers stored at 38° F. to 42° F. for two months or longer, then reconditioned at 70° F. for three to four weeks prior to frying. French fry texture and color values are from tubers stored at 40° F. to 45° F. and processed directly.

EXPLANATION OF TABLE HEADINGS

S.G. - specific gravity, 1.0 deleted

Tuber rating - 1 = poor to 5 = excellent

Chip color - PCII color scale from 1 = white to 10 = dark brown

French fry texture - 1 = soggy to 5 = mealy

French fry color - 1 = brown to 5 = light yellow

Campbell Table 1. Yield, specific gravity, tuber rating, and chip color for entries grown in New Jersey Trial No. 1 at Elmer, New Jersey, 1976

Selection	Yield over 2 inches		S.G.	Tuber Rating	Chip Color	
	cwt/A	Percent			10 days @ 50° F	4 wks. @ 40° F
BR6863-3	360	92	75	2.8	3.0	7.7
BR6864-6E	389	86	59	2.8	3.8	9.7
CA02-7	334	80	68	3.0	3.2	7.8
CA02-13	242	74	57	2.5	4.2	9.9
CA46-11	344	88	62	2.5	3.1	6.0
CA55-24	405	92	73	2.9	3.0	6.4
CA63-1	429	92	69	2.8	4.3	8.8
CC05-15	295	90	58	3.1	4.5	9.8
CC05-17	323	82	70	2.4	4.0	8.5
CC05-19	377	95	56	2.1	3.7	8.9
CC06-5	360	83	69	3.1	3.9	8.2
CC06-12	254	68	58	1.5	3.3	8.3
CC08-3	204	70	76	2.2	3.7	8.8
CC54-8	349	85	72	3.0	3.3	7.0
CD12-18	223	60	70	3.1	3.3	7.5
CD139-9	260	82	71	3.1	3.1	7.4
B6965-10	417	91	76	1.6	3.2	6.4
B6987-184	255	83	73	2.4	3.0	8.2
AF24-33c	353	87	78	3.1	3.7	6.4
AF40-9c	288	75	61	1.8	4.7	8.9
AF41-9c	318	91	57	2.1	4.0	9.6
CC54-3a	276	82	68	2.6	3.1	7.6
Atlantic	448	92	82	3.4	3.2	7.3
Katahdin	275	92	57	2.0	4.8	9.1
Mean	324	84	67	2.5	3.7	8.0
Bayes LSD 5%	72	5	4	0.7	0.8	0.8
CV%	16	5	5	20	15	8

Campbell Table 2. Yield, specific gravity, tuber rating, and chip color for entries grown in New Jersey Trial No. 2 at Elmer, New Jersey, 1976.

Selection	Yield over 2 inches		S.G.	Tuber Rating	Chip Color	
	cwt/A	Percent			10 days @ 50° F	4 wks. @ 40° F
CD03-4	375	93	65	2.4	3.4	9.7
CD03-26	419	86	65	1.9	5.1	9.8
CD08-21	362	91	65	2.4	3.1	8.7
CD08-29	289	82	62	2.1	4.9	9.2
CD23-1	220	67	65	4.0	3.6	8.9
CD34-2	283	75	67	2.6	3.5	9.0
CD47-32	376	84	55	2.0	4.0	9.0
CD51-4	266	82	70	1.8	2.9	7.3
CD70-22	410	84	66	1.8	5.0	10.0
CD85-5	221	73	70	2.6	6.1	9.0
CD85-11	273	82	62	2.4	3.9	9.0
CD106-16	500	88	75	2.8	4.3	8.3
CD111-9	271	74	63	1.9	4.4	9.3
CD117-6R	162	80	61	1.6	5.7	10.0
CD130-7R	259	81	70	2.1	3.5	8.0
CD137-5R	293	91	81	2.8	3.6	8.7
AF197-2c	383	78	68	3.5	3.5	9.0
AF198-1c	173	70	52	1.8	4.0	8.7
AF201-4c	349	92	69	2.9	4.3	9.4
AF201-10c	303	76	63	3.2	4.0	8.6
AF204-5c	349	84	59	2.8	3.7	9.7
AF41-2	365	83	60	2.1	4.2	8.3
Superior	337	88	62	2.0	3.7	9.2
Mean	312	82	65	2.4	4.2	9.0
Bayes LSD 5%	78	5	8	0.7	0.8	1.1
CV%	19	5	8	21	15	8

Campbell Table 3. Yield, specific gravity, tuber rating, and chip color for entries grown at Napoleon, Ohio, 1976.

<u>Selection</u>	<u>Yield over 2 inches</u>		<u>S.G.</u>	<u>Tuber Rating</u>	<u>Chip * Color</u>
	<u>cwt/A</u>	<u>Percent</u>			
BR6864-6E	415	95	74	3.4	6.9
BR7085-1	461	96	92	2.8	7.6
CA02-7	466	95	90	3.6	5.4
CA46-11	491	97	86	2.5	5.5
CA55-24	392	96	82	2.8	5.4
CA63-1	519	97	84	2.9	6.0
CC05-17	429	96	88	2.9	8.0
CC05-19	491	96	77	2.1	7.3
CC06-5	446	96	90	3.2	7.1
CC06-12	454	96	81	2.5	5.6
CC08-3	385	97	89	2.9	5.3
CC54-8	364	96	97	3.5	5.9
CD08-21	396	98	79	2.5	5.9
CD12-18	375	92	87	3.2	6.0
CD23-1	390	93	84	3.5	6.4
CD51-4	399	94	100	2.8	5.4
CD106-16	450	97	87	3.1	5.6
CD111-9	415	97	81	2.5	7.9
CD130-7R	361	95	88	3.0	5.8
CD139-9	411	97	83	3.2	5.7
B6987-184	359	94	97	2.6	3.2
AF24-33c	429	97	90	2.9	5.3
AF25-18c	390	92	75	2.6	7.4
AF40-9c	420	94	80	2.4	6.5
Atlantic	512	98	95	3.1	4.8
Katahdin	493	97	89	3.1	6.0
Superior	450	98	81	1.9	6.2
Wauseon	397	93	80	2.4	7.4
Mean	427	95	86	2.8	6.1
Bayes LSD 5%	69	2	6	0.6	1.0
CV%	11	17	5	15	12

* Tubers stored at fluctuating temperatures 40° F to 55° F, then reconditioned 10 days @ 70° F.

Campbell Table 4. Yield, specific gravity, tuber rating and processing quality of entries grown in Soup Trial 1 at Perham, Maine, 1976.

Selection	Yield over 2 inches		S.G.	Tuber Rating	Chip Color	French Fry	
	cwt/A	Percent				Texture	Color
BR6862-2	440	93	75	3.4	7.5	3.0	2.8
CA02-7	406	88	70	2.8	7.5	2.6	3.6
CA02-13	448	90	67	3.1	8.0	2.1	2.9
CA63-1	451	94	71	2.9	7.0	2.8	3.5
CG05-15	393	91	70	3.5	9.5	2.5	3.2
CG05-17	424	95	73	3.0	9.8	3.0	3.1
CG05-19	478	93	68	2.9	8.3	3.1	3.8
CD03-4	388	90	76	3.0	6.0	2.8	3.4
CD03-26	474	95	77	2.8	9.8	2.4	2.6
CD47-32	439	79	69	3.2	10.0	2.0	2.5
CD48-6	352	82	66	3.5	10.0	2.0	2.4
CD70-22	435	88	70	3.2	9.3	2.4	2.9
CD85-5	363	83	70	3.1	9.0	1.8	2.8
CD111-9	435	92	63	2.6	9.0	2.3	2.9
CD124-1R	276	81	66	2.0	5.5	3.0	4.0
AF25-18c	387	83	70	2.9	7.8	2.9	3.8
AF198-1c	442	90	57	2.6	6.5	2.0	3.2
AF201-4c	434	90	69	2.5	8.8	2.5	3.0
Superior	442	92	72	2.1	6.0	2.4	3.4
Katahdin	372	88	70	3.2	8.3	2.2	2.8
Kennebec	481	92	72	2.6	6.8	3.1	3.8
Wauseon	393	94	67	2.6	9.0	2.2	2.1
Mean	406	89	70	2.9	8.2	2.5	3.1
Bayes LSD 5%	56	3	4	0.5		1.0	0.4
CV%	9	3	4	12		22	10

Campbell Table 5. Yield, specific gravity, tuber rating, and processing quality of entries grown in Frozen Product Trial 1 at Perham, Maine, 1976.

Selection	Yield over 2 inches		S.G.	Tuber Rating	Chip Color	French Fry	
	cwt/A	Percent				Texture	Color
BR7085-1	338	86	84	3.3	7.3	2.5	2.8
B6987-184	252	83	91	3.2	4.7	4.0	3.5
CA46-11	353	85	80	2.7	5.3	3.2	3.0
CA55-24	339	90	85	3.3	5.7	3.0	3.8
CC06-5	293	84	85	3.0	7.0	3.0	3.5
CC06-12	321	87	81	3.3	5.3	3.2	3.2
CD08-21	274	87	86	3.2	6.0	2.8	4.3
CD08-29	353	89	78	3.5	8.3	2.5	2.5
CD12-18	286	81	85	1.8	7.0	2.3	3.2
CD67-2R	293	86	95	3.0	7.7	2.2	2.5
CD106-16	363	84	86	2.8	7.0	3.5	3.0
CD130-7R	275	81	92	3.8	4.7	3.8	3.7
CD138-4R	289	82	77	3.3	7.0	2.2	2.5
C7221-7	351	86	83	3.3	5.3	3.7	2.8
C7222-6	384	95	73	2.8	7.7	2.5	2.7
C7225-5	337	77	80	3.5	7.3	2.7	2.5
C7232-4	344	91	81	3.7	4.3	3.0	4.0
C7285-10	325	90	82	3.0	7.3	3.2	2.5
C7306-6R	206	67	74	1.5	8.3	2.2	2.3
C7306-12R	286	79	79	4.0	8.3	2.5	2.5
CC54-3a	358	87	82	3.7	6.0	3.7	3.5
AF41-2	386	91	79	3.5	6.0	3.2	3.2
Kennebec	397	92	77	3.0	6.0	2.2	3.2
Raritan	358	88	93	3.3	7.3	2.8	2.3
Superior	418	89	79	2.5	6.3	2.0	2.7
Wauseon	328	89	84	3.5	8.3	2.0	1.5
Mean	327	86	82	3.1	6.6	2.8	3.0
Bayes LSD 5%	60	6	5	0.7		1.1	0.5
CV%	11	5	4	13		22	14

Campbell Table 6. Yield, specific gravity, tuber rating, and processing quality of entries grown in Chip Trial 1 at Perham, Maine, 1976.

Selection	Yield over 2 inches		S.G.	Tuber Rating	Chip Color	French Fry	
	cwt/A	Percent				Texture	Color
Campbell 11	383	95	80	3.4	6.5	3.8	4.0
Campbell 12	515	96	73	3.5	7.5	1.8	2.4
Campbell 13	418	92	78	3.2	8.3	1.6	2.0
BR7093-23	389	83	76	3.8	6.0	2.5	3.5
BR7104-10	403	86	69	3.5	6.8	2.5	3.2
BR7108-2	379	92	78	3.1	6.5	3.2	2.9
B6965-10	374	90	85	2.9	3.3	2.0	4.0
CA61-3	349	83	78	1.8	3.8	3.9	4.0
CC08-3	318	80	79	2.5	5.8	2.5	2.6
CC54-8	348	92	83	3.6	6.5	3.1	4.0
CD23-1	401	91	78	3.9	7.0	3.1	3.9
CD34-2	370	92	80	3.0	7.0	2.9	3.4
CD51-4	414	94	78	2.5	5.5	2.6	3.1
CD85-11	408	84	64	3.5	7.3	2.0	2.5
CD139-9	335	86	72	3.4	6.5	3.1	3.9
C7215-12	317	81	78	2.9	5.8	4.0	3.4
AF24-33c	355	84	79	3.1	6.3	3.4	3.9
AF40-9c	424	93	67	2.8	8.3	2.6	2.8
AF197-2c	457	94	68	4.0	8.0	2.8	2.9
AF201-10c	391	81	65	3.4	6.8	1.5	3.2
Kennebec	487	92	73	2.9	6.8	2.1	3.8
Norchip	374	80	78	2.8	5.5	3.0	3.1
Superior	427	92	72	2.6	7.0	1.9	2.8
Wauseon	425	91	68	3.0	9.0	2.0	1.9
Mean	394	88	75	3.1	6.6	2.7	3.2
Bayes LSD 5%	41	3	3	0.5		0.7	0.5
CV%	8	2	4	12		23	13

New Jersey

Melvin R. Henninger

Potato Variety Evaluation

Experiment Nos. 1 and 2 were conducted at Rutgers Research and Development Center in South Jersey on a well-drained sandy loam soil. All plots were 3' wide and 24' long. Experiment No. 1 was an observational trial with no replications. Experiment No. 2 was a randomized block design with four replications. They were planted April 7 and harvested midseason on August 17.

Experiment Nos. 2, 3, and 4 were conducted at the Vegetable Research Farm in Central Jersey on well-drained loam. These plots were single row, 3' wide and 24' long with four replications. They were all planted on April 8. Experiment No. 2 was a randomized block design and harvested early on July 15. Experiment No. 3 was a lattice square design harvested mid-season on August 16. Experiment No. 4 was a randomized block design harvested late on September 28.

Experiment No. 5 was conducted on the Johnson Bros. farm in South Jersey on a moderately well-drained loamy soil. These plots were double rows, 3' wide and 12' long, in a lattice square design with three replications. They were planted April 6 and harvested mid-season on August 18.

Commercial fertilization, insect, disease, and weed control were used in all experiments. Irrigation was used to supplement normal rainfall. Specific gravities were determined by the air and water method.

Many of the seedlings were tested at several locations and harvest dates. To evaluate each seedling at all locations, they are listed in the table in numerical order with the experiment number identifying the location or harvest dates.

Key to Ratings System

Plant Type: 1=decumbent poor canopy, 2=decumbent med. canopy, 3=decumbent good canopy, 4=spreading poor canopy, 5=spreading med. canopy, 6=spreading good canopy, 7=erect poor canopy, 8=erect med. canopy, 9=erect good canopy.

Plant Size: 0=v. small, 1=small, 2=medium, 3=med. large, 4=large, 5=v. large,

Plant Appearance: 0=v. poor, 1=poor, 2=fair, 3=good, 4=excellent.

Air Pollution: 0=dead, 1, 2, 3 4=decreasing appearance of plants with all leaves showing symptom, 5=most leaves with symptom but plant still appears good, 6, 7, 8=decreasing percent of foliar symptom, 9=no symptom.

Maturity: 0=v. early, 1=early, 2=med. early, 3=medium, 4=med. late, 5=late, 6=v. late.

Tuber Color: 0=white, 1=buff, 2=tan, 3=net, 4=red, 8=russet.

Tuber Shape: 0=round, 1=rd.-flat, 2=oblong, 3=oblong-flat, 4=oblong-rd., 5=long-flat, 6=long.

Tuber Conformation: 0=poor, 1=fair, 2=medium, 3=good, 4=excellent.

Eye Depth: 1=depth, 2=medium, 3=shallow.

Second Growth:)

Growth Crack:) 1=severe, 2=moderate, 3=slight, 4=none.

Hollow Heart:)

Internal Discoloration:)

New Jersey Table 1. Data from six potato variety trials grown at three locations in New Jersey, 1977.

Plant Data			Air Pollution	Maturity	Tuber Data								Yield over 1-7/8" cwt./A	Specific Gravity	Percent of Tubers over		
Type	Size	Appear.			Color	Shape	Conf.	Eye Depth	Sec. Gr.	Gr. Cr.	H. Heart	Int. Disc.			Exp. No.	Seedling	1-7/8"
2	1	2	5	3	1	2	2	3	2	4		1	B6503-5	275			
2	1	2	6	3	0	3	1	3	4	4	3	4	B6503-5	355	73	90	26
5	2	3	7	4	2	0	4	3	4	4		1	B6951-1	411			
5	2	2	4	3	0	0	4		4	4	4	4	B6951-1	210	58	90	22
5	2	3	7		0	4	3	3	4	4		4	B6951-1	261	60	92	40
5	2	2	5	4	3	0	3	3	4	4	4	3	B6951-1	386	66	96	64
7	4	2	4	1	0	2	1	3	4	4	4	4	B6955-14	433			
2	1	3	5	2	0	4	4	3	4	4	4	4	B6969-2	344	67	98	78
4	1	1	5	2	1	4	4		4	4	4	4	B6969-2	245	57	93	51
4	2	2	6	1	0	4	4	3	4	4	4	3	B6969-2	331	67	96	65
4	3	2	6		0	4	3	3	4	4		4	B6969-2	293	54	96	57
4	2	1	4	2	0	4	1	3	4	4	4	4	B6969-2	324	66	96	74
6	3	3	4	5	1	2	1	3	4	4	4	4	B6987-184	314			
8	3	4	7	1	0	2	2	3	4	4	4	4	B7009-4	474			
9	5	4	8	6	0	4	2		4	4	4	4	B7009-4	293	56	94	58
8	5	4	7	4	0	4	3	3	4	4	4	3	B7009-4	414	66	98	76
9	3	4	7	4	0	4	2	3	4	3	4	4	B7009-4	533	63	97	85
5	2	2	6	4	0	2	2	3	2	4	4	3	B7024-6	373	87	96	71
6	3	3	6	1	8	6	3	3	3	4	4	4	B7160-4	396			
6	3	4	8	2	8	6	2	3	4	3	4	2	B7160-4	283	70	86	19
9	3	3	5	3	8	6	2	3	3	4	4	3	B7160-4	345	68	88	42
5	3	3	6	1	0	0	3	3	4	3	3	4	B7165-17	360			
2	1	2	7	5	2	0	2	3	3	4			B7167-2	232			
2	1	2	6	2	2	2	3	3	4	4	4	4	B7167-2	247	73	91	39
5	2	2	6	0	8	2	1	3	4	4	4	4	B7196-20	229			
6	4	3	6	3	2	0	4	3	4	4	4	3	B7252-3	570			
6	4	4	6	6	1	0	3		4	3	4	2	B7252-3	182	51	80	29
6	3	4	6	3	0	0	3	3	4	4	3	2	B7252-3	313	57	89	38
6	3	4	6	4	3	0	3	3	4	4	3	2	B7252-3	480	64	97	78
3	2	4	6	3	0	0	2	3	2	4	4	4	B7516-9	363			
4	2	2	6	3	0	0	3	2	4	4	4	3	B7516-9	328	62	95	59
3	2	3	7	3	0	4	3	2	3	3	4	4	B7516-9	468	69	96	78
3	2	4	7	3	0	0	2	3	3	4	4	4	B7572-4	399			
9	3	3	6	5	8	6	2	3	2	2	4	3	B7583-6	359	81	96	63
9	4	3	7	6	8	2	2		2	4	4	4	B7583-6	37	61	40	01

New Jersey Table 1. (cont'd.)

Plant Data			Air Pollution	Maturity	Tuber Data								Exp. No.	Seedling	Yield over 1-7/8" cwt./A	Specific Gravity	Percent of Tubers over	
Type	Size	Appear.			Color	Shape	Conf.	Eye Depth	Sec. Gr.	Gr. Cr.	H. Heart	Int. Disc.					1-7/8"	2-1/2"
5	4	3	7	5	8	2	2	3	4	4	4	4	4	B7583-6	215	71	87	25
9	4	3	7		8	7	2	3	4	4		4	5	B7583-6	181	63	83	20
7	2	2	5	6	8	2	1	3	3	4	4	4	6	B7583-6	342	72	93	50
2	4	2	5	1	4	0	3	3	4	4	4	2	1	B7595-3	402			
5	3	2	6	4	0	4	1	3	1	4	4	4	1	B7595-7	513			
5	2	3	4	3	4	2	2	3	2	4			1	B7603-1	226			
2	1	2	3	1	4	0	3	2	4	4			1	B7603-6	327			
2	1	2	4	2	4	0	4	3	4	4			1	B7603-8	293			
6	2	3	5	2	8	2	4	3	4	4			1	B7608-2	422			
3	2	3	5	2	8	4	3	3	4	4	4	3	6	B7608-2	364	65	89	54
6	2	3	5	1	8	2	2	3	3	1	4	4	1	B7608-4	393			
7	4	4	6	5	0	0	2	1	4	4	4	1	1	B7621-2	430			
5	3	2	4	0	0	0	2	3	4	4	4	3	1	B7621-9	334			
8	3	4	5	1	8	2	3	3	4	4	4	4	1	B7636-15	338			
2	1	2	5	0	4	0	3	3	4	4	4	4	1	B7650-9	304			
2	1	0	3	2	0	4	2	3	4	4	4	4	1	B7664-2	271			
5	3	3	6	2	8	2	3	3	3	4	4	2	1	B7678-17	430			
6	3	3	4	1	8	6	1	2	2	2	4	2	1	B7680-6	342			
4	1	2	4	0	8	4	3	3	4	3	4	4	1	B7680-10	322			
4	1	1	6	1	8	6	1	3	3	4	4	4	1	B7684-3	207			
1	0	0	3	0	8	6	1	3	3	4	4	4	1	B7684-6	112			
1	1	1	3	0	8	2	3	3	4	4			1	B7685-8	240			
5	3	3	5	1	8	2	3	3	3	3			1	B7711-11	325			
4	2	3	5	1	8	2	3	3	4	4			1	B7715-11	285			
8	4	4	7	6	4	0	3	3	3	4			1	B7744-5	550			
6	4	4	8	6	4	4	2	3	2	4			1	B7744-6	507			
5	2	3	6	3	0	2	1	3	3	4			1	B7766-3	350			
3	2	3	5	4	8	4	1	3	3	2			1	B7783-6	299			
4	2	1	4	3	0	4	2	2	4	4			1	B7802-2	364			
2	3	2	5	1	0	0	3	3	4	4	3	4	6	B7802-2	392	72	97	70
2	1	1	3	0	0	6	2	3	4	4	4	4	1	B7813-5	282			
9	4	4	5	2	0	0	2	3	4	4			1	B7828-13	246			
8	4	4	7	5	0	0	2	3	3	4	4	4	4	B7828-13	281	80	90	39
5	4	3	8		1	0	2	3	2	3		4	5	B7828-13	213	68	88	31
2	1	2	4	1	2	0	3	3	4	4	4	4	1	B7832-2	307			

New Jersey Table 1. (cont'd.)

Plant Data			Air Pollution		Tuber Data								Yield over 1-7/8" cwt./A	Specific Gravity	Percent of Tubers over		
Type	Size	Appear.			Color	Shape	Conf.	Eye	Depth	Sec. Gr.	Gr. Cr.	H. Heart			Int. Disc.	Exp. No.	Seedling
9	5	4	7	4	0	4	2	3	4	4			1	B7838-5	404		
9	5	4	8	6	0	2	3	3	3	4	4	4	1	B7845-4	464		
2	2	2	4	2	2	2	2	3	1	4			1	B7848-2	262		
5	3	3	6	3	0	2	2	3	3	4	3	4	4	B7848-2	144	71	67
5	2	3	6	4	0	4	2	3	3	4	4	4	1	B7858-5	430		11
5	2	2	5	5	0	0	3	3	4	4	4	4	1	B7859-2	305		
5	3	3	6		0	0	3	3	1	4		4	5	B7859-2	267	66	85
8	2	1	3	6	0	0	3	3	3	4	4	1	6	B7859-2	322	89	93
9	4	4	7	5	1	2	2	2	4	4	4	4	1	B7863-2	398		45
6	4	4	7	4	1	0	3	3	3	4	4	3	1	B7865-12	575		
9	5	4	4	2	0	0	1	2	3	4	1	4	6	B7865-12	540	70	93
4	2	2	4	1	1	0	4	3	4	4			1	B7872-7	337		66
5	3	3	4	2	1	0	4	3	4	4			1	B7897-3	331		
2	2	3	5	4	0	0	3	3	3	4			1	B7902-4	329		
5	3	4	6	2	0	0	3	2	4	4	4	2	4	B7902-4	297	66	89
5	2	2	5	3	0	4	2	3	3	3	4	2	6	B7902-4	341	68	92
7	3	2	6	2	0	4	3	3	4	4			1	B7902-9	207		60
2	1	2	7	3	0	2	3	3	3	4	4	1	4	B7902-9	230	67	95
7	2	3	3	0	0	3	2	3	3	4	4	2	6	B7902-9	263	76	97
2	1	2	4	2	1	0	2	3	3	4			1	B7905-2	494		72
2	2	2	6	3	0	4	1	3	2	3			1	B7910A-7	420		
6	5	4	5	4	1	4	2	3	3	4			1	B7925-3	477		
5	2	2	6	3	1	2	3	3	3	4			1	B7927-1	342		
2	2	1	2	1	0	0	2	3	3	4			1	B7929-11	282		
2	2	2	6	4	2	2	2	3	1	4	4		1	B7930-2	471		
7	3	2	5	4	0	4	2	3	4	3	4	4	1	B8018-2	392		
2	0	2	4	0	0	0	2	3	4	4	4		1	B8024-1	329		
5	2	3	6	4	2	0	3	3	4	4	4	4	1	B8086-3	386		
5	4	4	7	3	0	0	3	1	4	4	4	4	4	B8086-3	368	72	97
8	3	2	7	5	0	0	3	3	4	4	4	4	6	B8086-3	528	71	97
6	4	4	5	5	2	0	4	3	4	4			1	B8091-8	560		
6	3	3	6	3	0	0	4	3	4	4	4	3	4	B8091-8	397	82	95
7	3	2	4	3	1	0	2	3	4	2			1	B8108-3	292		64
2	2	2	4	1	1	0	3	3	3	4			1	B8123-12	339		
9	4	4	8		2	0	2	3	3	4		3	5	B8123-12	292	53	90

New Jersey Table 1. (cont'd.)

Plant Data			Air Pollution	Maturity	Tuber Data								Yield over 1-7/8" cwt./A	Specific Gravity	Percent of Tubers over		
Type	Size	Appear.			Color	Shape	Conf.	Eye Depth	Sec. Gr.	Gr. Cr.	H. Heart	Int. Disc.			Exp. No.	Seedling	1-7/8"
4	3	2	5	0	0	4	4	3	4	4		1	B8148-4	316			
5	3	4	3	1	0	0	2	2	4	3		1	B8154-9	379			
2	1	2	3	0	0	0	3	3	4	4		1	B8185-5	162			
6	4	4	7	5	2	0	4	3	4	4		1	B8191-8	560			
4	2	3	7	4	0	2	2	3	1	4		1	B8202-1	362			
5	2	3	5	3	4	0	3	2	2	4		1	B8212-1	442			
5	2	1	5	1	8	6	2	3	4	4		1	B8218-4	243			
8	5	4	5	6	0	4	1	3	2	4		1	B8229-1	504			
5	3	4	6	4	0	6	0	2	2	4	4	2	1	B8264-1	528		
3	1	3	5	1	4	0	1	3	4	4		1	B8275-10	189			
2	1	3	7	4	0	0	3	3	4	3	4	4	1	B8275-15	325		
6	3	4	6	3	8	6	2	3	3	4	4	4	1	B8281-5	417		
2	2	3	7	3	1	0	1	3	0	4			1	B8302-3	533		
4	2	1	4	1	3	0	4	3	3	2			1	B8302-5	312		
2	1	2	6	3	3	4	2	3	3	4			1	B8308-6	420		
2	2	2	5	1	3	6	2	3	3	4			1	B8316-3	524		
2	2	2	6	4	8	2	3	3	4	4			1	B8338-7	286		
6	2	4	4	2	8	2	2	3	2	4	3	1	6	B8338-7	334	74	93
1	0	1	4	0	8	6	1	2	1	4			1	B8345-5	212		70
1	1	1	4	0	8	6	3	3	2	2			1	B8348-1	275		
3	1	2	7	2	3	0	3	3	3	4			1	B8354-11	343		
4	0	0	3	3	0	0	4	3	3	4			1	B8372-2	165		
4	2	2	4	1	4	0	2	2	2	4	4	3	1	B8375-1	486		
5	2	2	4	1	1	0	3	3	2	4			1	B8375-3	329		
8	5	3	6	3	2	0	3	3	4	4	4	2	1	B8392-5	427		
8	4	3	8		3	0	3	3	3	4		2	5	B8392-5	289	62	97
9	4	3	6	6	3	0	3	3	3	4	4	1	6	B8392-5	411	70	74
7	2	2	5	4	0	4	3	3	4	4	4	4	1	B8392-6	274	96	77
4	2	1	6	4	0	0	2	3	4	2	4	4	1	B8392-7	324		
2	2	1	5	5	0	4	2	3	4	4	4	3	1	B8393-1	392		
2	2	2	7	2	0	0	2	3	3	4			1	B8393-5	371		
2	1	3	5	3	1	0	4	3	3	4			1	B8393-8	382		
7	3	2	4	1	0	0	3	1	2	4			1	B8395-3	371		
6	5	4	7	3	0	0	3	3	4	4			1	B8424-10	557		
4	2	2	4	4	2	4	3	3	4	4			1	B8424-11	331		

New Jersey Table 1. (cont'd.)

Plant Data			Air Pollution Maturity	Tuber Data								Exp. No.	Seedling	Yield over 1-7/8" cwt./A	Specific Gravity	Percent of Tubers over	
Type	Size	Appear.		Color	Shape	Conf.	Eye Depth	Sec. Gr.	Gr. Cr.	H. Heart	Int. Disc.					1-7/8"	2-1/2"
5 3 3	7 5	0 0 1 2	1 4	1	B8428-6	542											
2 1 2	4 5	0 0 3 3	3 4	1	B8428-10	313											
2 2 2	6 3	0 0 2 3	4 2	1	B8429-1	325											
4 3 3	7 3	0 0 3 3	4 4 4 4	4	B8429-1	345	62	95	67								
2 2 2	7 6	3 0 2 3	4 4 4 3	1	B8429-9	496											
4 3 1	3 2	2 2 2 3	4 4 4 3	1	B8434-14	377											
5 4 3	5 4	0 0 2 3	4 4 4 4	1	B8434-15	353											
5 4 2	4 2	0 0 3 3	4 4 4 2	1	B8435-8	382											
1 1 1	3 3	2 0 2 3	4 4 4 2	1	B8435-13	275											
7 3 1	4 3	3 0 3 3	4 4 4 3	1	B8443-5	461											
6 3 3	7 5	3 0 3 3	4 4 4 4	1	B8459-6												
4 3 3	7 4	3 2 2 3	1 4 4 4	1	B8462-1	452											
4 2 2	6 6	0 0 2 3	1 4	1	B8467-1	489											
5 2 3	5 5	0 0 2 3	2 4	1	B8477-12	487											
3 2 3	6 5	0 0 4 3	4 4	1	B8480-3	477											
4 0 0	3 1	0 0 2 3	3 4	1	B8497-46	272											
4 1 1	4 3	3 0 4 3	4 4	1	B8498-9	333											
6 4 4	5 3	1 0 4 3	4 4	1	B8500-27	470											
2 1 1	6 3	0 2 2 3	4 4	1	B8501-11	305											
5 3 2	7 6	2 0 2 2	2 4	1	B8501-13	457											
8 5 4	6 5	0 0 2 3	4 4 4 4	1	B8514-18	592											
5 3 2	5 3	3 0 2 3	4 4 4 4	1	B8529-3	370											
5 3 3	6 4	8 6 1 3	3 4 4 4	1	B8530-7	363											
1 2 2	4 2	8 6 3 3	4 4 3 4	1	B8530-9	220											
2 2 3	5 2	2 2 3 3	4 4 4 4	1	B8540-7	424											
1 2 2	5 2	3 4 3 3	4 4 4 4	1	B8542-10	311											
4 2 2	7 2	0 0 3 3	4 4 4 4	4	B8542-10	328	78	91	33								
4 2 2	6 3	0 4 2 3	2 2 4 3	1	B8542-16	322											
5 3 4	7 6	0 0 3 3	4 4	1	B8542-22	534											
2 1 2	4 3	0 0 3 2	4 4	1	B8543-9	328											
1 3 3	3 0	2 0 3 3	4 4	1	B8543-11	235											
1 1 2	6 5	1 0 2 3	2 4	1	B8543-16	248											
4 1 1	5 1	3 4 2 3	4 4	1	B8553-10	288											
4 2 2	5 4	2 2 2	2 4 4 4	3	B8553-10	185	68	84	23								
5 3 2	4 1	2 0 3 3	3 4	1	B8574-10	352											

New Jersey Table 1. (cont'd.)

Plant Data			Air Pollution Maturity	Tuber Data					Exp. No.	Seedling	Yield over 1-7/8" cwt./A	Specific Gravity	Percent of Tubers over	
Type	Size	Appear.		Color	Shape	Conf.	Eye Depth	Sec. Gr.					Gr. Cr.	H. Heart
8 5 3	3 1	3 0 3 3	4 4	1	B8575-5	453								
2 2 2	5 0	0 0 3 3	4 2	1	B8578-21	324								
5 2 2	8 3	0 0 3	2 2 4 4	3	B8578-21	213	61	83	37					
3 2 3	5 1	0 2 4 3	4 4	1	B8581-1	437								
3 0 3	8 3	0 4 3 3	4 4 4 3	4	B8581-1	310	75	88	23					
7 4 3	5 3	3 0 3 3	4 4 4 1	1	B8590-5	490								
5 3 3	6 5	3 4 3 3	4 4 4 4	1	B8590-11	327								
7 4 3	4 3	3 0 3 3	4 4 4 4	1	B8598-5	388								
5 3 1	4 1	2 4 3 3	4 4 4 4	1	B8598-8	305								
5 3 2	6 3	2 2 3 3	3 4 4 4	1	B8598-9	419								
5 4 3	5 3	3 0 3 2	4 4 4 1	1	B8599-16	519								
2 2 1	5 2	3 0 2 3	4 4 4 4	1	B8599-40	391								
8 5 2	4 2	3 0 4 3	4 4 4 3	1	B8599-42	476								
5 3 2	6 4	1 0 3 3	3 4	1	B8599-45	457								
4 4 1	3 1	1 4 2 3	4 4	1	B8612-2	299								
2 1 2	5 3	0 0 3 3	2 4	1	B8614-10	314								
5 3 3	6 6	2 0 2 2	4 4	1	B8615-1	486								
2 2 2	5 1	3 0 4 3	2 4	1	B8615-2	279								
4 0 0	4 0	0 0 4 3	4 4	1	B8616-7	248								
4 2 1	5 2	1 4 3	3 4 4 3	3	B8616-7	232	56	96	49					
2 1 1	3 1	0 2 2 3	2 4	1	AF24-33C	286								
8 5 3	3 2	0 2 1 3	1 4	1	AF25-18C	392								
3 2 3	4 3	3 0 4 3	3 4 4 4	1	AF40-9C	389								
2 2 2	5 3	0 4 3 3	2 4	1	AF41-2	397								
6 3 4	7 3	1 0 2 3	2 4 4 4	4	AF41-2	373	69	91	41					
2 2 2	5 3	3 4 2 3	2 4 4 4	6	AF41-2	531	63	93	54					
6 4 4	6 5	2 2 3 3	3 4 3 4	1	BR6316-5	439								
3 3 3	8 4	3 4 3 3	4 4 1 3	4	BR6316-5	337	66	96	44					
6 4 4	7 5	2 2 3 3	1 4	1	BR6626-5	479								
6 4 3	6 5	2 4 1 2	1 4 3 2	6	BR6626-5	554	72	81	45					
5 3 2	5 1	0 0 2 3	2 4 4 3	1	BR6862-2	346								
6 3 3	5 2	0 0 3 3	3 3 3 4	6	BR6862-2	383	70	93	67					
8 4 3	5 3	1 0 3 3	3 3	1	BR7088-18	519								
8 3 3	6 2	0 0 3 3	4 4 4 3	4	BR7088-18	326	79	96	63					
2 1 2	4 1	0 0 3 3	4 4	1	BR7093-20	351								

New Jersey Table 1. (cont'd.)

Plant Data			Air Pollution Maturity	Tuber Data							Exp. No.	Seedling	Yield over 1-7/8" cwt./A	Specific Gravity	Percent of Tubers over			
Type	Size	Appear.		Color	Shape	Conf.	Eye Depth	Sec. Gr.	Gr. Cr.	H. Heart					Int. Disc.	1-7/8"	2-1/2"	
2	2	2	6	4	0	0	3		4	4	4	4	3	BR7093-20	231	71	95	66
4	2	2	6	1	1	0	3	3	4	4	4	4	4	BR7093-20	306	76	97	75
8	5	3	4	2	0	0	3	3	3	3			1	BR7093-23	434			
4	4	2	6	4	0	4	3	3	4	4	4	4	4	BR7093-23	374	63	93	56
4	3	2	5	3	0	0	3	3	4	4	3	4	4	BR7093-42	275	63	96	73
7	4	2	4	1	0	0	3	3	4	4			1	BR7093-48	156			
7	3	1	6	2	0	0	2	2	4	3	4	4	4	BR7093-48	249	66	97	76
5	3	3	5	3	2	2	4	3	3	3			1	BR7103-1	386			
6	3	3	7	4	3	2	3	3	4	4	3	3	4	BR7103-1	390	71	95	59
6	4	4	8	6	3	0	3	3	3	4			1	CA02-7	334			
6	3	3	7	4	1	4	2	3	4	4	4	4	4	CA02-7	252	67	85	39
5	4	3	6	5	2	2	2	3	3	4			1	CA28-2	398			
8	5	3	7	3	0	6	3	3	4	4	4	4	4	CA28-2	287	69	91	33
8	4	2	5	2	0	4	2	3	1	4			1	CA40-7	332			
7	4	3	6	4	0	0	2	3	3	4	3	3	4	CA40-7	311	61	84	25
6	3	4	6	4	3	2	2	3	4	4			1	CA46-11	447			
6	3	4	7	3	0	2	3	3	4	4	4	4	4	CA46-11	344	70	94	41
4	2	2	5	4	0	2	2	3	3	4	3	4	6	CA46-11	402	68	97	73
5	3	3	6	4	3	2	3	3	3	3	4	4	1	CA55-24	364			
5	2	2	6	4	2	2	3		4	4	4	4	3	CA55-24	231	69	89	26
6	3	3	7	4	2	4	2	3	4	4	2	3	4	CA55-24	342	75	95	55
6	3	3	7		2	2	2	3	3	4		4	5	CA55-24	280	66	94	48
6	2	3	6	6	2	2	2	3	3	4	4	4	6	CA55-24	357	76	95	69
5	2	2	6	2	0	2	2	3	3	2	4	3	2	CA61-3	341	78	96	62
6	3	3	8	6	1	0	3		3	3	4	4	3	CA61-3	234	61	85	18
5	3	3	7	4	1	4	3	3	4	4	4	4	4	CA61-3	397	79	92	50
9	5	4	8		2	0	2	3	3	3		4	5	CA61-3	422	71	94	54
5	3	3	5	3	0	4	1	3	4	4	4	3	6	CA61-3	333	81	94	64
5	2	3	6	4	0	6	1	3	4	3	4	4	1	CA63-1	380			
5	2	3	5	3	0	0	3	3	4	4	4	2	1	CC06-5	363			
5	3	3	5	2	0	0	3	3	4	4	4	4	1	CC06-12	518			
3	2	3	6	3	0	0	4	3	4	4	4	4	1	CC08-3	424			
3	2	3	7	3	3	0	3	3	4	4	4	3	4	CC08-3	267	71	92	37
5	3	3	5	5	0	2	3	3	4	4	4	4	1	CC26-1	401			
5	3	3	7	4	0	4	2	2	4	4		4	4	CC26-1	327	82	94	53

New Jersey Table 1. (cont'd.)

Plant Data			Tuber Data								Exp. No.	Seedling	Yield over 1-7/8" cwt./A	Specific Gravity	Percent of Tubers over	
IType	ISize	IAppear.	IAir	Pollution	IMaturity	IColor	IShape	Iconf.	IEye	Depth	ISec. Gr.	IGr. Cr.	IH. Heart	IInt. Disc.	1-7/8"	2-1/2"
8 5 3	4 2	3 0 2 3	4 4 4 4	1	CC54-18	306										
8 2 5	4 5	3 0 4 3	4 4	1	CD08-30	269										
8 4 3	7 3	3 0 3 3	4 4 3 3	4	CD08-30	319	72	94	56							
2 1 2	4 1	0 4 2 3	3 2	1	CD12-18	297										
4 3 2	6 0	1 0 4 3	4 4 4 4	4	CD12-18	182	73	87	27							
2 1 2	4 1	3 0 3 3	2 4	1	CD23-1	295										
3 2 3	4 5	0 4 2 3	3 4	1	CD85-5	248										
2 1 1	4 3	2 0 3 3	3 4	1	CD85-11	303										
7 3 2	4 4	0 2 3 3	3 4	1	CD106-16	406										
2 1 3	5 3	0 2 1 3	2 4 4 3	1	CD111-9	352										
7 4 3	4 1	1 4 2 3	2 4 4 4	1	CD117-6R	324										
6 5 4	7 2	0 4 2 2	4 4 4 3	4	CD117-6R	345	67	95	62							
7 4 3	4 6	3 4 2 3	4 4 4 4	1	CD137-5R	309										
5 3 3	5 1	8 6 2 3	3 4 4 4	1	CD138-4R	436										
8 2 3	6 3	8 6 3 3	4 4 1 4	4	CD138-4R	330	63	90	47							
2 1 3	6 3	1 0 3 3	4 4 4 1	1	CD139-9	352										
2 1 2	6 3	0 0 4 3	4 4 4 3	4	CD139-9	304	76	95	56							
2 2 3	7	2 0 4 3	3 4 4	5	CD139-9	283	78	94	59							
1 1 2	6 3	0 4 2 2	2 4	1	F61025	197										
5 3 3	6 4	0 0 2 3	4 4 4 3	4	F61025	305	75	91	55							
9 4 4	6 3	0 0 3 3	1 4 4 2	1	F6208	308										
8 5 4	8 5	0 0 3 3	2 4 2 3	4	F6208	310	73	95	58							
5 2 3	5 2	3 2 2 3	3 4	1	WC330-1	306										
5 3 3	6 3	3 6 1 3	3 4 4 4	4	WC330-1	268	70	86	28							
6 3 4	6 4	3 0 4 3	4 4 4 1	2	Atlantic	452	84	96	74							
6 4 4	6 6	3 0 4	4 4 4 4	3	Atlantic	268	76	90	32							
6 4 4	7 4	3 0 4 3	4 4 3 2	4	Atlantic	382	82	94	62							
6 4 4	7	3 0 3 3	4 4 0	5	Atlantic	386	79	96	62							
5 3 3	5 4	3 0 4 3	4 4 4 1	6	Atlantic	520	81	97	72							
3 1 3	5 3	1 0 3 3	3 4 4 4	2	C-11	292	81	97	61							
3 2 4	8 6	2 0 3	4 4 4 4	3	C-11	245	69	89	26							
3 2 4	7 1	1 0 3 3	4 4 4 4	4	C-11	304	77	94	51							
3 1 4	7	1 0 3 3	4 3 4	5	C-11	344	75	97	63							
3 0 3	6 3	2 0 3 3	4 4 4 4	6	C-11	347	74	96	75							
5 2 2	6 6	0 0 1 3	3 4 4 4	6	Chippewa	422	65	89	52							

New Jersey Table 1. (cont'd.)

Plant Data		Air Pollution Maturity	Tuber Data							Exp. No.	Seedling	Yield over 1-7/8" cwt./A	Specific Gravity	Percent of Tubers over	
Type	Size		Color	Shape	Conf.	Eye Depth	Sec. Gr.	Gr. Cr.	H. Heart					1-7/8"	2-1/2"
9 4 4		6 5	0 0	2 3			3 4	4 4		2	Hudson	464	79	97	83
9 5 4		8 6	0 0	2			4 4	4 4		3	Hudson	134	61	87	34
9 5 4		8 5	0 0	1 3			3 3	4 4		4	Hudson	280	68	94	65
9 5 3		8	0 0	2 3			3 4		4	5	Hudson	255	63	95	63
9 5 4		7 5	0 0	2 3			3 4	4 4		6	Hudson	409	72	96	77
8 4 4		6 4	0 0	3 3			4 4	4 4		2	Katahdin	410	68	96	76
9 4 3		7 6	0 0	2			3 4	4 4		3	Katahdin	183	50	87	30
5 3 3		7 5	0 0	3 3			4 4	4 4		4	Katahdin	330	63	93	54
5 4 3		7	0 0	2 3			3 4		4	5	Katahdin	312	57	93	55
5 3 2		6 6	0 0	2 3			3 4	4 4		6	Katahdin	438	63	96	77
5 4 4		7 5	0 0	1 3			2 3			1	Kennebec	501			
9 5 4		7 5	0 4	1 3			2 4	4 4		6	Kennebec	477	69	96	76
3 3 3		5 3	0 0	1 3			2 4			1	Norchip	271			
6 4 3		5 4	0 0	1			4 4	4 4		3	Norchip	226	65	89	36
5 3 3		7 4	0 0	2 3			4 4	4 3		4	Norchip	324	71	93	60
5 3 3		8	1 4	1 2			2 3		4	5	Norchip	267	66	92	54
6 2 4		6 3	0 4	1 3			2 4	4 4		6	Norchip	365	75	94	61
2 0 0		3 0	4 4	3 3			3 4			1	Norland	317			
2 1 0		3 2	4 4	3			2 4	4 4		3	Norland	219	55	89	28
4 2 1		5 5	4 0	1 1			2 3			1	Red Bliss	456			
5 2 2		5 2	3 4	2 2			3 4	4 3		2	Superior	291	71	96	66
5 2 2		6 6	2 4	2			3 4	4 4		3	Superior	231	66	94	34
5 3 3		6 3	3 4	2 2			4 4	4 4		4	Superior	329	71	94	48
5 3 3		6	3 4	2 2			3 3		4	5	Superior	327	60	96	55
4 2 1		6 1	3 4	2 2			3 4	4 4		6	Superior	263	65	96	63
6 4 4		5 2	8 6	1 3			2 4			1	Targhee	161			
6 4 4		8 4	8 6	2 3			3 3	4 4		4	Targhee	175	60	71	8
2 2 1		4 2	2 4	3 3			4 4			1	York	262			
5 2 2		6 2	2 1	3 3			4 4	3 4		4	York	263	78	95	54

NEW YORK (LONG ISLAND)

R. C. Cetas

Evaluation of Potato Cultivars and Breeding Lines
for Scab Resistance on Long Island in 1976

Fifty-nine breeding lines and cultivars were evaluated for scab resistance at the Long Island Vegetable Research Farm in 1976. The soil was naturally infested with Streptomyces scabies. The pH of the Haven loam (formerly Sassafras sandy silt loam) soil varied from 5.9 to 6.9 in November 1975. Lime (500 lb/A) was applied and incorporated with the soil with a disk harrow after the field was plowed on April 20, 1976.

Mancozeb (8% dust) treated seedpieces were hand planted in 10-hill single-row plots on April 22. Each plot was paired with one of the Chippewa cultivar, which was planted by machine. The hand planted seedpieces were spaced 12 inches apart in the row, and the machine planted ones nine inches. All rows were 34 inches apart. The 8-16-8 fertilizer (1875 lb/A) and Temik 15G (33 lb/A in the seed furrow) were applied as the seed furrows were opened with a two-row potato planter. Weeds were controlled with a broadcast application of Lorox (1.5 lb active ingredient per acre) on May 7 and of Eptam (5 lb active ingredient per acre) on June 1. Foliar sprays were applied as needed for insect and disease control. Approximately one inch of water was applied by overhead sprinkler irrigation on June 23 and July 15 to supplement rainfall. The tubers were harvested on September 20.

Forty tubers, or all tubers if less than 40 were available, from each plot were washed and examined for scab lesions. Each tuber was scored 0 (no lesions) to 4 (deep pits) for type of scab present and 0 (no scab) to 5 (61% or more) for surface area covered by scab lesions. These values were converted to individual tuber indices that ranged from 0 (no scab) to 140 (61% or more of the surface area covered by deep pitted scab). The scab index for each plot was calculated by dividing the sum of the individual tuber indices by the number of tubers examined. The index for each cultivar and breeding line in the replicated trial was determined by calculating the average of the two plots. A scab index ratio was calculated for each cultivar and breeding line by dividing the cultivar or breeding line index by the average index of their respectively paired Chippewa plots and multiplying the quotient by 100. The ratios allow one to determine quickly which cultivars or breeding lines were more or less resistant to scab than Chippewa and to compare one cultivar or breeding line with another.

The scab indices for the Chippewa cultivar were, in general, lower than normal in 1976. Consequently, it often was difficult to distinguish between the highly and moderately resistant breeding lines and cultivars. The breeding lines and cultivars that appeared to be highly resistant included FL-162, B6962-2, B7200-33, B7608-2, B7608-4, M2-18, M348-45, M351-17, N85-4, NY-54, P27-1, Norgold Russet, Russet Burbank, Superior and Wauseon.

New York (Long Island) Table 1. Results of growing breeding lines and cultivars of potatoes in soils that were infested with Streptomyces scabies at Riverhead, New York 1976.

Cultivar or breeding line	Scab index		Ratio ^{1/}	Type of scab on affected tubers			Percentage of tubers with scab	
	Line	Chipp- ewa		Majority of lesions		Average lesion	Line	Chippewa
				Line	Chippewa			
10-hill, nonreplicated, 40 tubers								
B6503-5	17.7	14.0	126.4	4	4	3.5	75	58
BR6863-3	2.4	23.7	10.1	2	4	2.2	50	78
F9-31	1.6	16.0	10.0	3	4	2.9	20	60
K357-16	1.1	7.0	15.9	2	4	2.1	35	32
M2-18	0.0	1.7	----	0	3	0.0	0	22
M2-21	1.2	18.0	6.7	2	4	2.4	18	70
M351-17	0.2	5.2	3.8	2	4	2.0	8	30
N61-25	18.0	17.2	104.6	4	4	3.2	72	82
N85-4	0.1	10.3	1.0	2	4	2.0	5	65
P2-5	2.0	9.6	20.8	3	4	2.7	22	55
P6-1	7.4	21.0	35.2	2	4	2.6	78	78
P6-3	6.0	8.1	74.0	2	4	2.7	55	50
P27-1	0.1	3.2	3.1	2	3	2.0	2	40
P54-42	5.8	17.4	33.3	3	4	2.6	67	78
P54-48	2.4	0.2	----	3	2	2.7	35	12
NY-54	0.0	8.9	----	0	4	0.0	0	65
NY-56	0.2	2.9	6.7	3	3	2.5	5	30
Waueson	0.0	12.3	----	0	4	0.0	0	55
10-hill, 2 replications, 80 tubers								
Abnaki	1.0	8.4	11.9	2	4	2.2	24	40
Bake King	13.8	25.8	53.5	3	4	3.2	62	74
Cascade	2.0	25.4	7.9	2	4	2.5	34	78
Hudson	4.8	7.1	67.6	3	4	2.7	52	54
Katahdin	10.1	28.8	35.1	3	4	2.9	66	80
Katahdin	13.2	23.4	56.4	3	4	3.3	78	81
Kennebec	2.2	14.0	15.7	2	4	2.4	31	68
Norgold Russet	0.0	7.1	----	0	4	0.0	0	46
Onaway	1.1	12.5	8.8	2	4	2.2	22	54

(New York (Long Island) Table 1 continued on next page)

(New York (Long Island) Table 1 continued on next page)

New York (Long Island) Table 1. (Concluded).

Cultivar or breeding line	Scab index		Ratio ^{1/}	Type of scab on affected tubers		Percentage of tubers with scab			
	Line	Chipp- ewa		Majority of lesions		Average lesion			
				Line	Chippewa	Line	Chippewa		
Peconic	14.5	21.8	66.5	3	4	3.1	3.6	68	76
Penn 71	10.7	17.2	62.2	4	4	3.3	3.4	75	66
Russet Burbank	0.0	9.5	-----	0	4	0.0	3.4	0	54
Superior	0.1	16.3	0.6	2	4	2.0	3.6	4	64
Wischip	1.0	13.6	7.3	2	4	2.1	3.3	19	61
FL-162	0.2	11.7	1.7	3	4	3.0	3.5	4	55
FL-657	5.5	25.5	21.6	3	4	2.6	3.7	49	76
NY-57	15.1	16.0	94.1	4	4	3.6	3.6	56	48
B6951-1	2.2	19.6	11.2	3	4	2.6	3.7	30	68
B6962-2	0.6	12.6	4.8	2	4	2.2	3.4	16	52
B6969-2	6.8	13.2	51.5	3	4	2.7	3.8	45	61
B6987-56	11.0	28.8	38.2	4	4	3.5	3.8	52	76
B6987-29	3.4	21.2	16.0	2	4	2.3	3.5	71	61
B7009-4	1.1	18.9	5.8	2	4	2.1	3.5	28	72
B7200-33	0.2	19.6	1.0	2	4	2.0	3.5	8	76
B7516-9	0.9	12.9	7.0	2	4	2.1	3.4	25	54
B7608-2	0.2	13.4	1.4	3	4	3.0	3.6	1	64
B7608-4	0.02	15.4	0.1	2	4	2.0	3.6	1	60
B7679-9	1.0	7.3	13.7	3	4	2.5	3.4	14	44
B7680-6	2.3	25.7	8.9	2	4	2.3	3.5	34	51
B7802-2	0.5	9.2	5.4	3	4	2.6	3.4	6	61
B7805-1	14.4	17.5	82.3	4	4	3.5	3.6	80	63
B7859-2	31.0	17.6	176.1	4	4	3.5	3.8	85	60
B7902-4	0.5	7.6	6.6	2	4	2.1	3.6	11	35
B7902-9	1.8	23.3	7.8	2	4	2.2	3.7	31	71
B8392-5	5.6	21.0	26.7	2	4	2.2	3.7	70	76
K37-1	2.2	18.7	11.8	2	4	2.2	3.4	39	72
K349-7	15.0	18.0	83.3	3	4	3.0	3.6	80	66
L521-5	12.8	35.4	36.1	4	4	3.5	3.7	65	82
L521-7	1.2	9.8	12.2	3	4	2.7	3.6	20	61
M11-41	17.3	19.8	87.4	3	4	3.1	3.7	90	72
M99-7	7.2	13.8	52.1	3	4	3.2	3.7	44	52
M348-45	0.5	19.8	2.5	2	4	2.1	3.5	12	75

^{1/} Ratio = Index for cultivar or line divided by index for paired Chippewa plots multiplied by 100.

NEW YORK STATE

Joseph B. Sieczka

Results of Potato Variety Trials in Upstate New York

1975-1976

Five replicated variety trials were conducted in upstate New York by the Vegetable Crops Department in 1976. Russet and white selections were evaluated separately in each of two locations. One of the locations at the Thompson Research Farm in Freeville, New York. The experiments conducted there were planted on a Howard gravelly loam. The other location was Arkport, New York, where the experiments were conducted on muck soil. The fifth experiment was conducted with red skin varieties at the Thompson Research Farm.

Variety Trial I

Sixteen white skinned entries and two russets were included in Variety Trial I (see Table 1). Another white skinned clone was replicated in an outside guard row but was not included in the main experiment. Within row spacing was 9" for all clones except Russet Burbank, which was spaced at 12". The golden nematode resistant clone M11-41 produced the highest total and marketable yields. The clone AF41-2 produced the same marketable yield as Katahdin but had greater total yield. The clones L521-5, L521-7, Snowchip, Belleisle, Russet Burbank, and Kennebec produced total yields that were not significantly different from M11-41. Marketable yield of Kennebec tubers was among the lowest with 52% of the total yield being scored for misshapened or sunburned tubers. The clone K349-7 also had a high percentage of defects. M11-41 tubers are medium sized, round, slightly irregular in shape and have pink eyes. The seedling AF41-2 produces tubers that are primarily oblong, slightly flat, and have a scurfy or lightly netted skin. The golden nematode resistant seedlings, L521-5 and L521-7, ranked fourth and fifth in marketable yields. Tubers of these clones are round to oblong, slightly flattened, slightly irregular, and have a buff or off-white color skin. Tubers of both clones had a tendency to skin, probably related to their late maturity. Round, slightly irregular shaped tubers were produced by Snowchip. Belleisle tubers were primarily oblong, slightly flattened and had prominent lenticels. The highest specific gravity was produced by Atlantic followed closely by Russet Burbank. The clone 47156 was the only yellow-fleshed entry in the experiment. The russet clone B7160-4 produced a low yield of long, shallow eyed, nicely netted tubers. The clones Atlantic and L521-7 have shown a tendency toward internal necrosis on Long Island in 1975 and 1976 were free of the disorder in upstate New York. The clone CD08-21 had the greatest amount of internal necrosis in this experiment. Eight tubers of the 40 tubers cut were effected by the disorder.

Variety Trial II

Seven russeted clones were evaluated on mineral soil at Freeville, New York (see Table 2). All clones were spaced at 9" with the exception of Russet

Burbank which was spaced at 12". The highest yielding entry was B7583-6. Tubers of this clone are oblong, somewhat blocky, shallow eyed and slightly irregular in shape. Nooksack produced tubers that were relatively free of external and internal defects. Tubers of this clone are attractively netted, shallow eyed, and are long to oblong in shape. Nampa tubers have a tendency to be knobby. The two early maturing clones, Centennial Russet, and B7147-8 produced the lowest total and marketable yields. The specific gravity of Centennial Russet tubers was significantly lower than the other entries. Tubers of Centennial Russet and B7147-8 are long shallow eyed and attractive. Centennial russet tubers are nicely netted while tubers of B7147-8 tend to have a coarse heavy netting. Centennial Russet appears to be more susceptible to blackleg than the other entries.

Variety Trial III

The red skinned clones Chieftan, Bison, and Norland were included in this experiment. Chieftan outyielded Norland and Bison in total and marketable yield. Tubers of this clone were round to oblong, shallow eyed and had an attractive red skin which had a slight tendency to feather. The skin color of Bison was a deep, bright red. Tubers of this variety are uniformly round shallow eyed and attractive. The variety does have a tendency to develop growth cracks which were the primary reason for the relatively low marketable yield.

Variety Trials on Muck Soil

The description of the Russet clones in Variety Trial II applied to these clones grown on muck soil. The one exception is the skin texture on B7147-8 tubers. When grown on muck soil tubers of this selection have an attractive uniform netting. The golden nematode resistant clones, L521-7 and Atlantic, produced higher total and marketable yields than Katahdin. Tubers of the clone L521-7 had the same general appearance as their counterparts grown on mineral soil except that the skin was lighter and brighter. Atlantic tubers were more irregular in shape in this experiment than they were on mineral soil. Tubers of this clone produced the highest specific gravity in this experiment. Wischip tubers were round, shallow eyed and attractive. This clone produced the lowest total and marketable yields and had the lowest specific gravity in the experiment.

Storage Results

Data on chip color, after-cooking darkening, and sprout weight were collected on two experiments established in 1975 (see Tables 6 & 7). Samples were stored at 50°F from time of harvest until sprouting or cooking data were collected in 1976. Additional samples from Variety Trial I were stored at 45° until April 1 when the temperature was raised to 60°F. These samples were then fried on April 26, 1976. The clones Atlantic, Kennebec, B6503-2, NY57, 6CX6, K349-7 and Bison produced light colored chips when stored at both temperature regimes. The clones listed in Table 6 were relatively free of after-cooking darkening. Chieftan, however, had the greatest tendency toward this disorder. Bison produced the greatest amount of sprout growth and 6CX6 produced the least.

Of the russet clones listed in Table 7, B7147-8 produced the lightest colored chips. This clone also has the largest amount of sprout growth. Targhee and B7732-2 were most susceptible to after-cooking darkening.

Upstate New York Table 1. Variety Trial I. Freeville, N.Y. 1976^{1/}

Variety	Yield (cwt/A)		% of Total Yield			Mean Tuber Wt (oz)	Specific Gravity	Vine ^{2/} Maturity	% of Total Yield		Hollow Heart ^{3/}
	Total	US No. 1 2-4"	US No. 1 2-3 1/2"	3 1/2-4"	>4"				Mis.	Sunburn	
M11-41	504	355	57	14	0	5.1	1.076	7	0	15	1/40
AF41-2	471	333	54	17	0	6.8	1.078	7	3	20	0/40
Katahdin	462	333	46	27	0	6.6	1.076	4	1	20	2/40
L521-5	475	295	41	21	1	5.7	1.087	1	0	25	2/40
L521-7	466	283	31	30	10	6.9	1.081	3	3	20	5/40
Snowchip	411	272	44	22	1	5.3	1.079	6	2	18	7/40
Belleisle	422	268	38	26	6	6.9	1.085	1	3	21	4/40
Russet Burbank	403	247	57	4	0	6.0	1.088	1	11	4	3/40
Atlantic	392	241	41	20	0	5.2	1.091	6	3	25	10/40
Wischip	312	237	72	3	0	5.0	1.067	9	0	9	0/17
47156	350	235	38	29	2	6.2	1.079	1	6	16	6/40
CD08-21	330	229	53	16	1	8.1	1.076	7	9	15	0/40
BR6862-2	341	214	35	27	2	6.6	1.079	6	3	24	11/40
BR6863-3	275	213	41	36	1	6.2	1.079	7	6	12	1/40
BR7088-18	370	206	38	17	2	5.9	1.080	6	16	18	6/40
Kennebec	444	182	32	9	0	7.0	1.078	6	22	30	4/40
K349-7	389	133	19	16	5	8.8	1.067	5	30	18	1/40
B7160-4	277	120	43	0	0	3.8	1.068	9	6	9	0/15
D(.05)Tukey	(118)	(131)				(1.9)	(.007)				
F6208	474	327	38	31	7	5.9	1.090	2	2	6	19/40

^{1/} Planted May 6, 1976, between row spacing 34", 9" spacing for all clones except Russet Burbank which was 12", fertilizer applied at a rate equivalent to 1,250 lb/A of 12-24-12 in bands at time of planting, killed September 7, harvested September 21, 1976.

^{2/} Vines rated on September 1, 1976, on a scale of 1 to 9, 1=green and vigorous, 9=completely dead.

^{3/} Numerator=number of tubers with hollow heart, denominator=total number of tubers cut.

Upstate New York Table 2. Variety Trial II, Russets. Freeville, N.Y. 1976^{1/}

Variety	Yield (cwt/A)		% of Total Yield			Mean Tuber Wt(oz)	Specific Gravity	Vine ^{2/} Maturity	% of Total Yield		Hollow ^{3/} Heart
	Total	US No.1 2-4"	US No. 1						Mis.	Sunburn	
			2-3½"	3½-4"	>4"						
B7583-6	367	244	59	8	0	5.2	1.090	4	8	11	2/40
Nooksack	283	233	68	14	1	6.5	1.088	2	3	4	0/33
Russet Burbank	360	222	54	7	0	5.6	1.091	2	10	5	2/40
Targhee	316	219	66	4	0	4.8	1.085	3	2	4	1/25
Nampa	352	193	49	6	0	5.2	1.089	2	16	8	2/40
Centennial Russet	254	177	64	5	0	4.7	1.068	8	4	4	1/35
B7147-8	255	136	51	2	0	4.6	1.077	8	4	3	1/30
D(.05) ^{Tukey}	(72)	(78)				(.9)	(.008)				

Upstate New York Table 3. Variety Trial III, Reds. Freeville, N.Y. 1976^{1/}

Variety	Yield (cwt/A)		% of Total Yield				Mean Tuber Wt(Oz)	Specific Gravity	Vine ^{2/} Maturity	% of Total Yield		Hollow ^{3/} Heart
	Total	US No. 1 2-4"	US No. 1			Mis.				Sunburn		
			2-3½"	3½-4"	4"							
Chieftan	420	317	62	15	0	5.2	1.067	6	7	3	1/40	
Norland	344	269	65	13	0	5.2	1.066	9	5	6	0/40	
Bison	318	200	45	18	0	4.9	1.065	9	18	4	2/35	
D _(.05) Tukey	(57)	(66)				ns	ns					

^{1/} See footnote 1, Table 1

^{2/} See footnote 2, Table 1

^{3/} See footnote 3, Table 1

Upstate New York Table 4. Arkport Russet Variety Trial (Muck Soil). 1976^{1/}

Variety	Yield (cwt/A)		Specific Gravity	% of Total Yield		
	Total	US No. 1		<1 7/8"	US No. 1	Culls
		>1 7/8"			>1 7/8"	
B7583-6	330	269	1.080	8	81	10
B7160-4	317	232	1.069	7	73	19
B7147-8	269	232	1.070	10	86	3
Russet Burbank	228	196	1.075	9	85	6
Nooksack	210	185	1.075	2	89	5
Nampa	185	145	1.073	13	78	9
Targhee	144	112	1.072	22	78	1
D(.05) ^{Tukey}	(77)	(73)	(.004)			

Upstate New York Table 5. Arkport White Variety Trial (Muck Soil). 1976^{1/}

Variety	Yield (cwt/A)		Specific Gravity	% of Total Yield		
	US No. 1			US No. 1		
	Total	>1 7/8"		<1 7/8"	>1 7/8"	Culls
L521-7	420	384	1.069	3	91	5
Atlantic	428	350	1.080	6	82	12
Katahdin	334	269	1.065	4	80	15
Wischip	268	241	1.061	7	90	3
D(.05) ^{Tukey}	(80)	(85)	(.004)			

^{1/}Planted May 14, 1976, between row spacing 34", 9" within row spacing, plot size 2 rows X 12', harvested September 22, 1976.

Upstate New York Table 6. Variety Trial I. Freeville, N.Y. 1975. Chip Color and Storage Results^{1/}

Variety	Chip Color ^{2/}		After-Cooking Darkening ^{3/} 1/10/76	Sprout Wt as % of Total Wt ^{4/} 4/18/76
	Crushed	Whole		
K37-1	63	41	57	40
L521-7	35	28	--	--
Atlantic (B6987-56)	80	48	82	52
L521-5	47	33	--	--
Alaska Red	55	36	43	33
Katahdin	56	41	58	39
Kennebec	62	45	71	47
B6503-2	75	50	63	45
NY57	73	48	63	45
6CX6	79	49	86	53
Chieftan	50	35	--	--
K349-7	67	46	73	51
Hudson	36	32	--	--
Bison	76	49	74	50
Russet Burbank	62	42	65	46
D (.05) Turkey	(14)	(8)	(16)	(8)
				(0.7)
				(5.2)

^{1/} Varieties ranked in order of US No. 1 (2-4") yields (see 1975 report).

^{2/} Agtron M30 colorimeter readings. Standards for crushed ships were 5005 and 5052.5 for 0 and 100 readings and for whole chips discs 00 and 90 gave readings of 0 and 90.

Minimum values for "generally acceptable color" for crushed chips are 55 to 60 and for whole chops 40 to 45. One slice of each of eighteen tubers per replication were fried in vegetable oil at 365°F. Samples fried on January 6th were stored at 50°F from time of harvest. Samples fried on April 26th were stored at 45° from time of harvest until April 1 when the temperature was raised to 60°F.

^{3/} Five tubers of each of the three field replications were peeled, dipped in 0.5% sodium bisulfite; cooked for 7 minutes in an autoclave at 15 p.s.i. and rated from 1-5, where 1=severe after cooking darkening, 5=no darkening.

^{4/} Stored at 50°F from time of harvest.

Upstate New York Table 7, Russet Variety Trial, Freeville, N.Y. 1975^{1/}
Chip Color and Storage Results

Variety	Chip Color ^{2/} 1/7/76		After Cooking Darkening ^{3/} 1/10/76	Sprout Wt as % Total Wt ^{4/} 4/9/76
	Crushed	Whole		
B7583-6	60	38	4.5	4.3
Targhee	48	35	3.4	3.9
B7732-2	65	42	2.6	2.1
Nampa	49	32	4.9	3.5
B7147-8	68	43	4.3	8.2
Russet Burbank	65	43	4.9	1.8
D(.05) ^{Tukey}	(11)	(6)	(0.9)	(2.4)

^{1/} See footnote 1, Table 6

^{2/} See footnote 2, Table 6

^{3/} See footnote 3, Table 6

^{4/} See footnote 4, Table 6

NEW YORK STATE

J. B. Sieczka, L. E. Weber, W. J. Sanok

Results of Potato Variety Trials on Long Island

1976

Two replicated variety trials were conducted on the Long Island Vegetable Research Farm at Riverhead, New York, by the Vegetable Crops Department and Suffolk County Cooperative Extension. Both experiments were planted on a sandy loam soil on April 19, 1976. The growing season was especially dry and irrigation water was applied as needed throughout the growing season. Experimental design for both experiments was a randomized complete block with four replications. Plot size was 2 rows by 20 feet long for Variety Trial I and 1 row by 20 feet for Variety Trial II.

L. I. Variety Trial I

Four named varieties and nine selections from the potato breeding programs of the USDA and the States of New York, Pennsylvania, and Maine were included in Variety Trial I (see Table 1). Seven of the entries are resistant to golden nematode. All entries are white skinned.

The golden nematode resistant siblings L521-5 and L521-7 produced total and marketable yields greater than Katahdin. Both lines were more irregular in shape than Katahdin with L521-7 being more attractive than L521-5. Tubers of L521-5 have moderately deep apical and lateral eyes. Internal necrosis was a major problem for the second consecutive year on Long Island in L521-7 and Atlantic tubers. The disorder was prevalent in M99-7 in 1976. Round, shallow eyed, slightly irregular shaped tubers with a smooth bright skin were produced by 6CX6. Some tendency toward shatter was noted with this selection.

L. I. Variety Trial II

Nine golden nematode resistant and 3 susceptible clones were included in Variety Trial II (see Table 2). The susceptible entries were Katahdin, B6951-1 and B6969-2. Nine of the entries were white skinned. The clones B7608-2, B7608-4 and B7680-6 were russets. These three selections were the lowest yielding lines and had a considerable amount of internal and external defects.

The highest yielding selection was B6987-29, a sibling of Atlantic. Tubers of this clone are irregular in shape and have moderately deep apical and lateral eyes. Like Atlantic, this clone has a tendency toward hollow heart but is relatively free of internal necrosis. The most promising unnamed golden nematode resistant entry in this experiment is B7805-1. This line produces attractive tubers which are round to oblong, shallow eyed and have a smooth white skin. Attractive tubers were produced by B6951-1 and B6969-2. The latter appears to be susceptible to hollow heart. Hollow heart was not much of a problem in large Hudson tubers. However, some of these tubers had brown centers.

Long Island Table 1. Variety Trial I^{1/}

Variety	Yield (cwt/A)		% of Total Yield			Specific Gravity	Hollow Heart ^{2/}	Internal ^{2/} Necrosis
	Total	US No. 1 >1 7/8"	US No. 1		Culls			
			1 7/8-3 1/2"	>3 1/2				
L521-5	513	493	82	14	1	1.071	3/40	0/40
L521-7	457	439	75	21	2	1.069	9/40	18/40
Katahdin	447	426	78	17	3	1.065	9/40	0/40
Superior	447	419	89	5	2	1.068	2/40	2/40
Atlantic	436	406	79	14	3	1.080	18/40	19/40
6CX6	430	404	88	6	3	1.073	3/40	2/40
M99-7	422	396	75	19	3	1.068	4/40	16/40
K349-7	418	309	58	16	5	1.063	4/40	6/40
B6503-2	394	363	85	7	4	1.075	9/40	0/40
Hudson	408	359	66	22	10	1.068	4/40	1/40
AF41-2	480	338	87	4	5	1.070	1/40	1/40
BR6863-3	344	330	78	18	2	1.078	5/40	0/40
K37-1	390	332	81	4	9	1.066	1/40	3/40
D(.05) Tukey (95)		(147)				(.007)		

1/ Planted April 19, 1976, between row spacing 34", within row spacing 9", plot size 2 rows x 20', 4 replications, fertilizer applied in bands at time of planting at a rate of 160-320-160/A, harvested 10/19/76.

2/ Ten large tubers from each replication were cut and inspected for hollow heart and internal necrosis. Numerator = number of tubers with hollow heart or internal necrosis, denominator = total number of tubers observed.

Long Island Table 2. Variety Trial II^{1/}

Variety	Yield (cwt/A)		% of Total Yield				Specific Gravity	Hollow Heart ^{2/}	Internal Necrosis ^{2/}
	Total	US No. 1 >1 7/8"	US No. 1			Culls			
			1 7/8-3 1/2"	>3 1/2"					
B6987-29	533	501	76	18	5	1.076	11/40	1/40	
Katahdin	482	459	82	13	3	1.067	4/40	6/40	
Atlantic	468	449	88	8	1	1.081	12/40	15/40	
B7805-1	417	400	67	29	2	1.063	6/40	7/40	
Hudson	456	395	60	27	12	1.070	3/40 (6/40)	1/40	
B6969-2	388	372	81	15	1	1.063	11/40	1/40	
B6951-1	366	334	89	2	4	1.065	2/40	8/40	
B7679-9	351	323	87	5	4	1.060	30/40	1/40	
B7200-33	356	313	86	2	4	1.061	2/40	0/40	
B7608-4	386	255	61	5	30	1.062	17/40	0/40	
B7680-6	320	244	71	5	18	1.060	27/40	0/40	
B7608-2	247	195	77	2	12	1.062	4/40	0/40	
D (.05) Tukey (113)		(111)				(.006)			

^{1/} See Long Island Table 1, Footnote 1. Plot size 1 row x 20 ft.

^{2/} See Long Island Table 1, Footnote 2. Fraction in parenthesis represents the number of tubers with brown centers over the total number of tubers cut.

NORTH CAROLINA

F. L. Haynes

Breeding Program

Earliness, disease resistance, chipping quality and adaptation to the Tidewater Area continue to be the primary objectives of the breeding program. Chipping quality is very important because more than 80 percent of the crop is processed in this manner.

Seedling Production and Clonal Maintenance. The summer hybridization program was conducted at Waynesville. Forty-two crosses produced 25,000 seed for 1977 segregate production. A segregating population of 15,000 seedlings was produced from which 195 clones were selected for further trial.

Eastern Trials. Three locations in the early commercial area were planted to performance trials of selected clones. The results are presented in N. C. Tables 1, 2 and 3. The new variety Atlantic (B6987-56) continued to be outstanding in yield and quality. Clone 64C2-3 also continued to produce good yields and acceptable chips.

Adaptation Study

The project of adaptation to the temperate zone of S. phureja and S. stenotomum was conducted and expanded. The segregating population included 17,000 seedlings of 60 families of which 40 have completed the fifth cycle of selection. The evaluation of families for dry matter was expanded and a sub-population established for high dry matter. A recurrent selection program was initiated utilizing as many diverse sources of high dry matter as possible.

A similar program for recurrent selection for increased heat tolerance was initiated. A coastal location which experiences very high temperatures in June, July and August is being planted to 30 segregating families. Surviving selections will be harvested in September and interbred to study the possibility of increases in tolerance to high temperatures.

North Carolina Table 1. Potato performance trial at Weeksville. Plots were 1 row, 30 ft. long, 4 replications of 20 entries in RCB, 40 hills/plot. Spacing in row, 9 inches; width row, 40 inches. Lb/plot x 4.356 = CWT/A. Fertilized: 550lb/A 10-20-20 BDCST and plowed in; 1700 lb/A 5-10-10 banded in row; Total/A = 140 lbs N, 280 lbs P₂O₅, 280 lbs K₂O. Planted 3-8-76, harvested 6-30-76 (113 days).

Variety	US#1-A cwt/A	Percent US#1-A	Specific Gravity	Chip ¹ / Color	Appear- ² / ance	Maturity
B6987-56	365	88.2	1.077	2.5	8.2	Med. early
Pungo	346	88.7	67	5.0	6.7	Med. early
72C75-2	345	85.7	58	4.5	8.5	Med. early
64C2-3(NC)	331	91.0	62	4.7	8.0	Med. early
Wauseon	317	88.7	63	4.0	8.5	Early
72C77-2	314	89.6	63	3.7	7.8	Early
64C2-3(M)	300	87.0	67	4.0	7.8	Med. early
B8398-N1	296	86.5	62	5.5	7.2	Med. early
B6959-N1	295	85.4	64	6.3	8.0	Med. early
B7127-N2	294	91.1	67	4.0	7.7	Early
Abnaki	289	89.8	62	5.7	7.7	Med. early
72C78-2	289	87.6	64	4.2	7.7	Midseason
Norchip	285	87.6	73	3.5	6.7	Med. early
Katahdin	280	86.7	64	4.7	7.5	Midseason
B8412-N2	267	90.0	73	4.2	8.0	Med. early
72C23-1	265	88.9	58	4.5	7.5	Midseason
Superior	261	91.7	72	3.0	9.0	Early
B7583-6	259	84.8	66	5.5	7.0	Med. early
71C15-20	254	78.2	81	3.0	8.0	Med. early
Penn-71	247	82.8	65	2.2	7.2	Midseason
L.S.D. .05	38	5.7			.6	
C.V. (PCT)	9.2	4.6			5.8	

¹/Chip color determined by Wise Foods, Borden, Inc., Berwick, Pa. Average of 5 samples, 1 per week for 5 weeks following harvest. 1-4 acceptable with grade 1 = perfect; 5 useable but not desirable, 6-14 unacceptable with 14=black.

²/Appearance

1 = Very poor 7 = Good
3 = Poor 9 = Excellent
5 = Fair

North Carolina Table 2. Potato performance trial in Tyrell County. Plots were 1 row, 30 ft. long, 4 replications of 22 entries and 16 augmented entries (4 per rep.) in RCB w/aug. ent. design. 40 hills/plot. Lbs/plot x 4.356 = CWT/A. Spacing in row, 9 inches, width row, 40 inches. Fertilized: 1500 lb/A 10-20-20. Planted 3-4-76, harvested 6-29-76 (115 days).

Variety	US#1-A cwt/A	Percent US#1-A	Specific Gravity	Chip ¹ / Color	Appear- ² / ance	Maturity
B6987-56	352	93.3	1.073	3.0	8.5	Med. early
64C2-3	350	93.4	59	3.7	7.8	Med. early
Penn-71	340	93.3	64	3.0	7.8	Midseason
Wauseon	323	92.9	60	3.7	8.8	Med. early
72C75-3	320	89.4	69	4.0	8.0	Med. early
Abnaki	318	97.2	64	5.5	8.0	Midseason
72C75-2	310	86.8	68	4.5	7.5	Midseason
B8398-N1	308	91.5	65	5.5	7.0	Midseason
Pungo	308	94.6	65	5.3	7.2	Med. early
72C78-2	289	91.7	66	4.2	8.2	Med. early
72C75-8	273	82.9	72	4.2	8.0	Med. early
Norchip	272	91.0	71	3.7	7.5	Med. early
72C23-1	258	91.3	58	5.8	7.0	Med. early
72C75-5	249	88.6	67	4.2	7.2	Med. early
72C77-2	249	89.0	58	4.0	7.5	Med. early
72C32-1	248	93.1	69	2.7	8.2	Med. early
B6959-N1	247	86.6	64	6.7	7.0	Med. early
71C15-20	244	94.0	80	3.2	8.0	Med. early
72C5-2	240	93.6	75	2.5	8.5	Early
Superior	230	95.3	68	2.2	8.5	Early
B8412-N2	217	88.7	69	5.3	7.0	Midseason
B7127-N2	199	92.1	61	5.0	7.5	Med. early

Augmented entries - Rep. 1 - adjusted yields

73C26-8	205	89.0	1.060	5.3	9.0	Med. early
72C23-3	188	93.1	68	3.5	7.0	Med. early
72C80-3	157	86.0	82	2.7	8.0	Med. early
B8676-N4	57	75.6	69	1.7	8.0	Med. early

Augmented entries - Rep. 2 - adjusted yields

72C58-2	277	93.5	69	2.5	9.0	Med. early
B8676-N3	256	86.2	66	4.2	8.0	Med. early
72C74-4	221	90.0	59	5.0	8.0	Med. early
B8669-N1	190	91.8	62	6.0	9.0	Med. early

North Carolina Table 2 continued.

Augmented entries - Rep. 3 - adjusted yields

R. LaSoda	378	82.7	-	-	7.0	Med. early
64C2-3 (M)	317	85.5	1.059	3.7	8.0	Med. early
72C68-3	313	91.8	73	4.7	9.0	Early
B8273-N1	121	79.4	70	4.5	8.0	Med. early

Augmented entries - Rep. 4 - adjusted yields

73C17-4	248	92.4	67	3.7	8.0	Med. early
B7583-6	172	75.2	-	-	6.0	Midseason
72C80-1	172	83.3	81	3.5	7.0	Med. early
B8796-N1	120	95.0	85	3.2	9.0	Med. early

L.S.D. (.05) Replicated entries (RE), augmented (AE)

RE	44	3.2	0.6
AE same rep.	89	6.4	1.2
AE dif. rep.	91	6.6	1.3
RE vs AE	72	5.2	1.0
C.V. (PCT)	11	2.5	5.6

1/ and 2/ See footnotes, N.C. Table 1.

North Carolina Table 3. Potato performance trial at Tidewater Research Station, Plymouth. Breeding clone performance trial. Plots were 1 row, 33.3 ft. long, 16 replicated entries, 20 augmented entries (5 per rep.), 4 replications in RCB w/aug. ent. design. 40 hills per plot. Spacing in row, 10 inches, width row, 38 inches. Lbs/plot x 4.1267 = CWT/A. Fertilized: 870 lbs/A 10-20-20. Planted 3-3-76, harvested 6-28-76 (115 days).

Variety	US#1-A cwt/A	Percent US#1-A	Specific Gravity	Chip ¹ / Color	Appear- ² / ance	Maturity
R. LaSoda	314.7	85.6			7.00	Med. early
B6987-56	304.3	92.1			8.00	Med. early
Abnaki	287.8	94.1			8.00	Med. early
Katahdin	251.7	84.8			7.75	Midseason
64C2-3	267.7	90.0			8.00	Med. early
Penn-71	265.1	89.8			7.50	Med. late
72C75-2	206.9	71.4			7.75	Med. early
Norchip	227.0	82.7			7.25	Med. early
Pungo	231.6	86.3			6.75	Midseason
B6959-N1	216.1	89.4			8.00	Med. early
Superior	221.8	93.4			8.50	Early
Wauseon	209.9	91.5			8.75	Med. early
B8412-N2	176.9	82.6			7.00	Midseason
72C77-2	172.8	83.5			7.25	Med. early
B7127-N2	187.2	94.4			8.00	Med. early
72C23-1	158.9	85.0			7.00	Midseason

Augmented entries - Rep. 1 - adjusted yields

72C75-3	307.8	85.5			8.03	Early
B8676-N4	278.9	82.7			8.03	Early
72C58-2	219.1	87.3			7.03	Early
72C78-2	159.2	88.4			7.03	Med. early
73C3-2	111.8	60.9			9.03	Early

Augmented entries - Rep. 2 - adjusted yields

64C2-3 (ME)	196.9	94.2			7.97	Med. early
72C75-4	124.7	88.6			6.97	Early
72C32-1	116.4	85.6			7.97	Med. early
71C15-20	135.0	96.3			7.97	Med. early
B8273-N1	48.4	85.8			8.97	Early

Augmented entries - Rep. 3 - adjusted yields

Katahdin (A)	287.3	87.8			7.03	Midseason
B8398-N1	248.1	93.0			7.03	Med. early
73C26-8	196.5	86.9			7.03	Med. early
72C75-8	192.4	87.6			8.03	Med. early
72C23-3	196.5	91.9			9.03	Early

North Carolina Table 3 continued.

Augmented entries - Rep. 4 - adjusted yields

R. LaSoda	346.9	90.0	6.97	Midseason
72C75-5	235.5	85.5	7.97	Early
72C80-1	183.9	77.6	7.97	Med. early
72C68-3	157.1	76.6	6.97	Med. early
72C80-3	181.8	95.6	7.97	Med. early

L.S.D. (.05) Replicated entries (RE), augmented (AE)

RE	41.6	6.6	0.54
AE same rep.	83.2	13.1	1.08
AE diff. rep.	85.8	13.5	1.11
RE vs AE	67.8	10.7	0.88

1/ and 2/ See footnotes, N.C. Table 1.

NORTH DAKOTA

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Breeding Program

Potato Crossing and Seedling Production. Two hundred and seventy crosses were made in the greenhouse during March, April and May of 1976. Characteristics looked for in making the crosses were high yield, high solids, russetting, bright red skin color, shape, good processing qualities and resistance to certain diseases and insects. Fifty-six thousand seedlings were grown in the greenhouse during the summer of 1976. This is an increase of about 30,000 since 1970 and an increase of 15,000 since 1975. Forty-one thousand seedlings were planted in the field at the Langdon Experiment Station in 1976 and about 1,000 were saved at harvest for further study and evaluation. Seedlings were planted at Langdon on May 4th and 5th and harvested on the 27th, 28th, and 29th of September.

A genetic study involving genotype-environment interaction, stability parameters, heritability and correlation in segregating populations of seedlings was started during 1976. This is the dissertation study of Mr. Javier Salinas-Gonzalez from Mexico.

Advanced Selections. Five hundred and sixty-four second year, eighty-three third year and ninety fourth year selections were planted in an adaptation trial at Grand Forks. Foundation seed stock of the second year selections were planted by the Plant Pathology Department at Absaroka and foundation seed of third year and older selections were planted at Casselton by the Plant Pathology and Horticulture Department. One hundred seventy-six second year selections and one hundred twenty-two third year and older selections were saved at Harvest. The plot at Grand Forks was planted on May 12 and harvested September 9th. Casselton was planted May 18 and harvested on September 14th and 15th.

California and Texas Program. For the past two years approximately 10,000 second and third size seedling tubers from families consisting mainly of russet skin tubers have been sent each year to Dr. Ron Voss and Mr. Don Halseth at Davis, California. These seedling tubers have been planted either at Stockton, California or Butte Valley, Oregon for selection under growing conditions in that part of the country. In addition advanced clones have been tested in replicated yield and adaptability trials at Shafter, California; Tulalake, California and Butte Valley, Oregon. Several clones of North Dakota origin have looked quite promising in California and the testing under such a wide range of environmental conditions has added much valuable genetic adaptability information to both the California and North Dakota program.

A much similar trial is conducted at Lubbock, Texas with Dr. C. Miller and Mr. Doug Smallwood. In 1976 approximately 10,000 North Dakota seedlings were planted in the Texas panhandle and selected for growing conditions there. Seed of the promising clones are sent back to North Dakota for further testing and also for seed increase.

Advanced clones of North Dakota-Texas origin were also planted in the panhandle or the Hereford area of Texas and in an adaptability trial at Grand Forks and a

seed increase plot at Casselton. Fifty third year clones and 72 second year clones were planted in the spring and thirty clones were saved at harvest.

In another cooperative program 5,000 seedling tubers from the Texas Potato Breeding Program and approximately 5000 seedlings from the Idaho Potato Breeding Program were planted at Grand Forks. Results from this experiment were very poor as the field dried out almost completely during the growing season.

Promising Selections. Several advanced clones or selections looked quite promising in 1976. Probably the most promising are ND8891-3, ND8888-2, ND8913-4Russ, ND8914-5Russ and ND8751-16. These five selections have been in the testing and increase program the longest and in general have the largest increase. Line ND8891-3 is a high yielding, oblong, high solids processing selection that should be quite well adapted for the production of french fries. Line ND8888-2 has similar characteristics to ND8891-3 but during the dry season of 1976 it was extremely rough at some locations. Line 8751-16 is a low sucrose selection that chips extremely well. Low yield is its disadvantage. Line ND8913-4Russ and ND8914-5Russ are two russets that are being tested, however they appear to be not much better than Norgold Russet.

Bison named two years ago continues to look quite good. Bright color, type and good chipping qualities are the main advantages of this variety.

Line ND6993-13Russ, grown as a seedling in 1964 and selected that fall and increased and tested in North Dakota for several years and then dropped, continues to do quite well in California and Washington. The selection was sent to California several years ago and was increased by a commercial grower in California. There are now several hundred acres grown both for fresh and processing (french fries) on the West Coast. No decision as to whether this selection will be named has been made, however on the West Coast it is known as "Minnesota Russet".

Other newer selections that appear promising are ND9583-1, ND8924-4Russ, ND9476-5, ND9516-4R, ND9567-2Russ, ND9642-3Russ, ND9358-3Russ (good tuber type but rough vine), ND9403-16R, ND9852-1Russ and ND9852-2Russ. Several of these are oblong and russet skinned and several have very good processing qualities. Advanced selections were increased by North Dakota foundation seed growers at Beach and in the Red River Valley and several lines were planted on the Ralph Matthews Farm at Barnesville, Minnesota in an adaptation and seed increase plot.

Variety Trials. Replicated variety trials were grown at Grand Forks, Park River, Minot, Williston and Carrington dryland and irrigation. Ernie French conducted the trial at Williston and Ben Hoag conducted the trial at Minot. The trials at Carrington were planted by the Horticulture Department, however Howard Olson conducted the trial throughout the rest of the season. Wayne Grinde was in charge of the Park River trial and Dennis Askim was in charge of the general maintenance of the Grand Forks trial.

The varieties were grown in plots of 25 hills and replicated four times in a randomized block. Twenty-five entries were grown at Park River and Grand Forks. Fifteen entries were grown at Carrington and fourteen entries were grown at Williston and Minot. Marketable yield consisted of all U. S. No. 1 tubers over 1 7/8 inches in diameter. Specific gravity was determined by the use of a potato hydrometer.

Spacing, fertilizer, soil type, planting and harvest dates of each location were as follows:

<u>Location</u>	<u>Spacing</u>		<u>Fertilizer</u>	<u>Soil Type</u>	<u>Planting Date</u>	<u>Harvest Date</u>
	<u>Row in.</u>	<u>Plant in.</u>				
Grand Forks	38	12	400#/A 20-20-10	Bearden clay loam	5/10	9/13
Park River	38	12	400#/A 20-20-10 5# N (fall)	Glyndon silt loam	5/4	9/8
Minot	36	14	100#/A 24-24-0	Williams loam	5/13	9/13
Williston	38	16	None	Williams loam	5/14	9/28
Carrington	38	12	400#/A 20-20-10	Heimdahl loam	5/3	
Irrigation						
Carrington	38	14	400#/A 20-20-10	Heimdahl loam	5/3	
Dryland						

The 1976 season will go down as one of the driest seasons on record. The season is reported to be as dry or dryer than that of the Nineteen-thirties. Temperatures were also quite warm. Grand Forks had .37 inches of precipitation in May and 4.76 inches in June, 1.75 inches in July, 2.25 inches in August and a half an inch in September for a total of 9.64 inches. At other locations, it was even dryer. Park River had approximately 2.00 inches of precipitation during the growing season. Carrington had 6.33 inches of precipitation and added 14.03 inches of irrigation water.

Red Pontiac produced the highest yield of all entries in the trial (North Dakota Table 1). The average yield of this variety for all locations was 321 cwt per acre. The high yield of Red Pontiac was not suprising as this variety is known for its good drought resistance and 1976 was a banner year for it. The next highest entry was ND8891-3 which had an average yield at six locations of 198 cwt per acre. Other high yielding entries were ND8888-2 and Norchip. Russet Burbank was the lowest yielding entry.

Line ND8891-3, a new white skinned selection, looked very promising in trial. It also has performed very well in several other states and Canada. Line ND8891-3 is a good processor, has high gravity and is oblong to blocky in shape. It is a cross between Cascade X ND7196-18 and seems to perform much better than its closest relative, ND8888-2, which is a cross between Cascade and Norchip. Line ND8891-3 which appears to have promise as a replacement for Kennebec, outyielded Kennebec by 100 cwt at Park River and 10 cwt at Grand Forks. Line ND8888-2, a selection that has looked very good the past few years did not perform as well this year. Line ND8888-2 had some heat sprouts and rough tubers and this no doubt was due to the extremely dry hot season that we had in 1976. ND8888-2 however has a much better vine than ND8891-3.

Bison yielded very similar to Norland but it had a much better red skin color. Centennial Russet did not look good in trial and it appears that the variety will be grown only as a seed variety in the Red River Valley.

The two russet skinned selections, ND8913-4Russ and ND8914-5Russ produced nice uniform tubers with good russetting, however, neither yielded up to Norgold Russet. Further yield data and performance studies are needed for these two russet selections before any decision can be made on their future.

Line ND9403-16R and ND9516-4R produced very good yields when grown only in trials at Park River and Grand Forks. Line ND9358-3Russ and ND9642-3Russ, two other russet skinned selections looked promising in trial. Line ND9358-3Russ produces nice russet tubers but again it is another one of those selections which has a very poor vine. The vine is rough and it looks like it has a virus early in the season.

In the Red River Valley trials, Grand Forks produced higher yields than that at Park River, N. Dakota. Again, rainfall no doubt was a contributing factor. The dryland trial at Carrington produced yields averaging 68 cwt per acre while the irrigated trial averaged 250 cwt per acre. This indicates the dryness throughout the season at this location.

Line ND8751-16, an excellent processing selection, but lacking yielding ability produced the highest solids (North Dakota Table 2). This selection which also has a very low sucrose sugar content at harvest time produced solids averaging 22.0 percent total solids when grown at six locations. It was quite similar to Norchip which had solids averaging 21.8 at the same location. Other entries with high solids were ND8913-4Russ, ND8891-3, ND8888-2 and ND8850-2.

Norland, ND8914-5Russ and Red Pontiac produced the lowest solids when grown at six locations. In the Red River Valley trials at Park River and Grand Forks, ND9403-19R produced very high solids, averaging 23.3 percent solids at the two locations. The russet selection, ND9642-3Russ had an average at the two locations of 22.2 percent solids. Average solids between the two Red River Valley locations were quite comparable, averaging 22 percent at Grand Forks and 21 percent at Park River. Likewise the irrigated and non irrigated trial at Carrington was similar averaging 18.4 percent at both locations. This no doubt could never be repeated.

Processing and Culinary Trials. Chipping tests are reported in North Dakota Tables 3 and 4. Chip samples were obtained from varieties and selections grown in the 1975 variety trial. The potatoes were chipped out of 40°F storage (14 weeks) and then stored at 70°F and chipped at weekly intervals for four weeks. This test is quite important as it shows just how many weeks that it takes for a certain variety or selection to be reconditioned and make satisfactory chips. The finished product was rated by a standard color chart and the photovolt meter. The photovolt meter seems to take care of certain amounts of human error in rating samples for color. For example at Grand Forks Kennebec had a rating of four and Norchip six after four weeks of conditioning, however on the photovolt meter Kennebec had a reading of 35.7 while Norchip had 36.5 (North Dakota Table 4). Percent total yield was also obtained.

In the Park River trial, Kennebec, Norchip, ND7878-1, ND8751-16, ND8850-2, ND8891-3, ND9403-16R and ND9403-21R all had very good chip color after reconditioning for four weeks. At Grand Forks Bison, Norchip, ND8750-20, ND8850-2, ND8888-2, and ND8891-3 produced the lightest chips after four week reconditioning. It appears from this test that the best chippers in the North Dakota trials were Norchip, ND8850-2 and ND8891-3.

The processing laboratory at East Grand Forks again tested several hundred new selections for chip quality. Of the 240 five-hill second, third and fourth year selections tested for chip quality, 39 equaled or exceeded the control, Norchip which had an Agtron reading of 43. The selections were stored at 43° F from

October 7 to December 14 and then reconditioned for four weeks and then chipped. Twenty-seven more promising third year and older selections were chipped out of 43° F on January 7th and then reconditioned until February 2 at 65° F and chipped. Several selections had good chip quality out of 43° F and they were ND9609-5, ND9403-21R, ND9403-16R, ND8297-1, ND9583-1, ND8751-16, ND8850-2, ND8750-20 and ND8297-1 compared to Norchip with an Agtron reading of 52 and Bison with 43, all of these selections had an Agtron reading over 45. At 65°F nine selections had an Agtron reading over 50 and Bison and Norchip had Agtron readings of 52 and 53, respectively.

The processing laboratory also tested the advanced selections for french fries and flakes. Several looked promising.

The Pillsbury Company tested twenty selections for physical, chemical, flake, processing and sensory characteristics. All of these selections were evaluated for future potential flake varieties for the Grand Forks processing plant. Bison and ND8750-20 were shown to have the most promise as flake varieties.

Boiling and baking tests were done on 25 varieties and selections grown in trials at Park River and Grand Forks during 1975 (North Dakota Tables 5 and 6). Most of the selections were relatively free of after cooking darkening and had good culinary qualities. Bison and Norland showed some after cooking darkening. The only selections that appeared to have very poor culinary qualities were ND8947-2Russ and ND9279-2R and both of these selections are being discarded. Sloughing was again found in high dry matter selections and varieties. Line ND8891-3, a promising white processing selection showed good culinary qualities.

Disease Testing. Potato spindle tuber virus and potato virus X indexing was carried out on 888 tubers from 235 selections. The use of a second isolated area (Absaraka) in which second year non-indexed seedlings were grown for one additional season prior to indexing, has reduced the number of selections to be indexed considerably without additional disease development occurring. Seventeen selections were found to be infected with PSTV by the tomato test and 18 selections were found to be infected with PVX using Gomphrena globosa. The Florida test confirmed a few PSTV plants but was more important in diagnosing leaf roll and other virus problems.

Advanced selections not previously tested for PSTV or PVX resistance were tested, but no immunity was apparent. Selections ND9004-1Russ and ND8767-10R were not immune but showed a low level of resistance to PVX.

Selection ND9403-16R and ND9403-19R were found to be as resistant to foliar infection caused by Phytophthora infestans, race -0, as the variety Kennebec.

Selection ND8767-10R which was previously reported as resistant to Verticillium albo-atrum, was found to be quite susceptible to a virulent isolate. The organism was easily re-isolated and symptom development on this selection was characteristic of verticillium wilt. No other selections tested were resistant.

A large field area in Grand Forks, previously supporting common scab development, was used for scab resistance evaluations. This area was large enough to provide space for replicated 5-hill plots of all selections. Twenty-nine selections out of 740 were found to be resistant to scab. Yearly repetition of these evaluations will be continued to confirm the replicated readings.

North Dakota Table 1. U. S. No. 1 Yield and Percent U. S. No. 1 of Potato Varieties and Selections Grown in State Wide Trials 1976.

	Grand Forks				Park River				Carrington				Minot				Williston		Average Yield Cwt/A
	Cwt/		%US	No.1	Cwt/		%US	No.1	Cwt/		%US	No.1	Cwt/		%US	No.1			
	A	No.1			A	No.1			A	No.1			A	No.1					
Red Pontiac	252	93	263	89	131	90	364	90	142	91	133	92	321						
ND8891-3	235	95	278	90	83	82	339	90	159	83	94	76	198						
ND8888-2	245	95	213	91	92	82	315	88	159	54	86	77	185						
Norchip	216	93	182	92	65	72	291	87	116	88	104	84	162						
Kennebec	225	95	178	90	102	92	239	88	114	92	95	76	159						
Norland	202	95	145	92	66	79	253	88	107	89	122	92	149						
Viking	187	90	134	94	88	92	231	91	121	95	117	93	146						
Norgold Russet	200	94	146	88	62	68	279	87	89	75	94	77	145						
ND8751-16	197	90	168	89	91	77	244	85	91	69	54	50	141						
Bison	189	96	138	89	55	75	225	75	88	83	124	88	137						
ND8850-2	191	91	158	87	32	55	247	85	84	65	67	63	130						
ND8913-4Russ	189	93	137	85	27	38	228	78	65	47	47	47	116						
ND8914-5Russ	167	89	126	86	37	60	168	86	51	54	70	69	103						
Russet Burbank	100	70	100	50	52	62	209	79	76	51	51	43	98						
Centennial Russet	101	73	112	85	31	58	119	74					91						
ND9403-16R	247	94	224	93									236						
ND9516-4R	235	97	171	91									203						
ND9403-19R	204	91	175	95									190						
ND9358-3Russ	198	94	137	90									168						
ND8742-2	199	97	132	95									166						
ND9642-3Russ	161	90	126	84									163						
ND9124-4	149	91	158	94									154						
ND9476-5	174	95	122	89									148						
ND9609-5	161	90	126	84									144						
ND9526-4Russ	132	86	109	84									121						
Average	192		158		68		250		104		90								

North Dakota Table 2. Specific Gravity^{1/} and Percent Total Solids of Varieties and Selections Grown in Statewide Trials - 1976.

	Grand Forks			Park River			Carrington				Minot			Williston			Sp. %	
	Total			Total			Dryland		Irrigation		Sp.		Total		Sp.		Gr. Ave.	
	Sp. Gr.	Total Solids		Sp. Gr.	Total Solids		Sp. Gr.	Total Solids	Sp. Gr.	Total Solids	Sp. Gr.	Total Solids	Sp. Gr.	Total Solids	Sp. Gr.	Total Solids	Gr. Ave.	Solid Ave.
ND8751-16	100	24.0		96	23.1		87	21.2	77	19.0	89	21.6	98	23.5	91	22.0		
Norchip	97	23.3		92	22.2		81	19.9	83	20.3	88	21.4	98	23.5	90	21.8		
ND8913-4Russ	95	22.9		96	23.1		75	18.6	75	18.6	94	22.7	95	22.9	88	21.4		
ND8891-3	90	21.8		93	22.4		86	20.9	71	17.7	88	21.4	100	24.0	88	21.4		
ND8888-2	95	22.9		91	22.0		82	20.1	69	17.3	88	21.4	98	23.5	87	21.2		
ND8850-2	95	22.9		85	20.7		77	19.0	75	18.6	85	20.7	98	23.5	87	21.2		
Kennebec	88	21.4		77	19.0		80	19.7	72	18.0	84	20.5	100	24.0	84	20.5		
Norgold Russet	91	22.0		87	21.2		74	18.4	72	18.0	80	19.7	93	22.4	83	20.3		
Russet Burbank	83	20.3		67	16.9		75	18.6	81	19.9	81	19.9	95	22.9	80	19.7		
Viking	86	20.9		82	20.1		73	18.2	70	17.5	76	18.8	92	22.2	80	19.7		
Bison	87	21.2		84	20.5		70	17.5	71	17.7	78	19.2	91	22.0	80	19.7		
Red Pontiac	83	20.3		75	18.6		67	16.9	70	17.5	71	17.7	89	21.6	76	18.8		
ND8914-5Russ	82	20.1		81	19.9		58	15.0	73	18.2	79	19.4	80	19.7	76	18.8		
Norland	81	19.9		79	19.4		59	15.2	65	16.5	78	19.2	89	21.6	75	18.6		
Centennial Russet	93	22.4		88	21.4		71	17.7	84	20.5					84	20.5		
ND9403-19R	101	24.2		93	22.4										97	23.3		
ND9124-4	94	22.7		91	22.0										93	22.4		
ND9642-3Russ	93	22.4		91	22.0										92	22.2		
ND9526-4Russ	96	23.1		84	20.5										90	21.8		
ND9403-16R	92	22.2		88	21.4										90	21.8		
ND9476-5	92	22.2		87	21.2										90	21.8		
ND8742-2	88	21.4		89	21.6										89	21.6		
ND9358-3Russ	90	21.8		87	21.2										89	21.6		
ND9516-4R	90	21.8		84	20.5										87	21.2		
ND9609-5	83	20.3		80	19.7										82	20.1		
Average	91	22.0		86	21.0		74	18.4	74	18.4	83	20.3	94	22.7				

^{1/} 1.0 deleted

North Dakota Table 3. 1976 Chip Tests of Varieties and Selections Grown at Park River, North Dakota 1975.

	1/28			2/11			2/18			2/25		
	Color ^{1/}		Photo ^{2/}	Color ^{1/}		Photo ^{2/}	Color ^{1/}		Photo ^{2/}	Color ^{1/}		Photo ^{2/}
	Chart	Yield ^{3/}		Chart	Yield ^{3/}		Chart	Yield ^{3/}		Chart	Yield ^{3/}	
Bison	8.5	18.5	30.5	5.0	41.0	30.7	5.5	34.0	32.0	5.0	34.0	34.7
Kennebec	8.5	15.7	31.5	6.0	39.0	31.5	5.0	40.5	32.0	4.0	35.7	34.5
Norchip	8.5	23.2	35.0	5.0	40.0	34.2	5.0	40.5	34.7	6.0	36.5	38.5
Norgold Russet	9.5	13.2	31.2	8.5	23.0	32.7	8.0	29.2	31.2	8.0	21.2	34.5
Norland	10.0	9.0	31.0	6.5	31.2	30.0	6.0	25.7	32.0	6.5	27.0	30.7
Russet Burbank	8.5	17.5	36.5	7.0	27.7	34.0	7.0	36.2	33.5	6.0	33.0	36.5
Viking	11.0	7.0	30.7	10.0	13.5	30.2	9.5	17.7	29.2	9.5	19.7	34.5
ND7878-1	8.0	21.7	34.0	6.0	34.0	31.5	6.5	35.0	32.5	5.0	38.2	35.5
ND8297-1	8.0	21.5	31.7	6.5	35.7	32.0	6.0	40.2	33.2	5.5	33.7	34.5
ND8750-20	8.5	17.0	29.7	5.5	36.7	31.2	5.5	34.7	32.2	4.5	31.0	33.7
ND8751-16	9.0	16.0	32.2	6.0	36.0	33.0	5.5	37.7	33.0	4.0	38.5	35.0
ND8767-10R	8.5	15.7	32.0	6.0	40.0	31.2	4.5	40.5	34.7	5.5	35.2	36.7
ND8850-2	8.0	25.0	33.5	7.0	31.7	33.7	6.0	38.0	34.5	5.0	38.2	35.0
ND8888-1	10.0	11.0	31.2	8.5	24.7	34.2	7.0	37.2	32.0	6.5	33.0	33.5
ND8888-2	8.0	21.2	34.2	7.0	29.2	34.7	6.5	34.2	33.2	5.5	32.2	36.7
ND8891-3	8.5	16.5	34.7	6.5	34.2	33.0	5.0	41.0	34.7	5.0	36.2	35.0
ND8913-4Russ	10.0	12.2	34.7	7.5	31.7	32.5	7.0	33.5	34.0	6.5	32.0	36.0
ND8914-5Russ	10.0	10.0	31.2	9.0	18.2	31.0	9.0	23.2	31.7	9.5	18.0	35.0
ND8947-2Russ	11.0	6.5	31.5	9.5	13.5	31.2	9.5	16.0	29.7	10.0	13.7	35.0
ND9086-1	9.0	19.0	32.5	7.0	31.5	31.2	6.0	32.2	31.2	5.5	32.2	32.5
ND9279-2R	10.5	7.5	28.2	9.5	13.7	29.5	9.0	21.0	30.5	9.5	27.7	30.2
ND9386-3R	9.0	13.2	28.0	7.0	32.2	30.7	6.5	30.7	29.5	7.0	32.2	32.7
ND9403-16R	9.0	15.2	30.2	5.5	38.0	30.5	5.5	37.0	31.2	5.0	36.0	34.0
ND9403-21R	7.5	24.2	33.0	5.0	40.2	31.5	4.0	45.5	33.2	4.0	35.0	36.0

^{1/} Color Chart (1 light, 11 dark).

^{2/} Photovolt - higher numbers are lighter in color

^{3/} Yield - Percent chip yield

North Dakota Table 4. 1976 Chip Tests of Varieties and Selections Grown at Grand Forks, North Dakota 1975.

	1/26			2/9			2/17			2/23		
	<u>1/</u> Photo <u>2/</u>		<u>3/</u>	Color		Photo	Color		Photo	Color		Photo
	Chart	Volt		Chart	Volt		Chart	Volt		Chart	Volt	
Bison	9.0	12.0	32.0	6.5	23.0	30.2	7.0	28.0	28.7	4.0	37.5	30.2
Kennebec	9.0	10.0	32.2	7.0	27.5	32.2	6.0	32.5	30.5	6.0	26.5	30.5
Norchip	9.0	11.2	33.5	8.0	29.7	33.7	7.5	30.7	34.0	4.0	39.2	32.7
Norgold Russet	11.0	6.0	32.0	9.5	13.5	31.5	9.5	16.5	31.5	9.0	13.5	30.7
Norland	10.0	9.0	30.5	9.0	20.2	30.2	7.5	28.2	31.0	7.0	31.5	31.2
Russet Burbank	11.0	8.0	31.9	9.0	16.0	32.2	9.0	18.5	31.2	9.0	20.7	29.2
Viking	11.0	5.7	30.7	10.0	10.2	30.7	10.5	12.2	31.7	9.0	14.7	31.7
ND7878-1	8.5	11.5	30.7	8.0	19.5	32.7	7.0	31.5	33.2	5.5	32.0	33.5
ND8297-1	10.5	11.0	32.0	8.5	21.0	33.7	8.0	29.0	33.0	6.0	31.2	32.0
ND8750-20	9.0	10.7	32.0	6.5	26.2	33.5	6.0	32.7	32.2	5.0	35.7	32.0
ND8751-16	10.0	8.5	33.7	8.0	24.0	33.2	6.5	33.0	35.0	7.0	27.5	33.2
ND8767-10R	9.5	9.0	32.7	8.0	26.0	32.2	6.5	30.4	33.7	7.0	28.0	34.2
ND8850-2	7.5	17.0	33.7	7.5	24.2	33.0	7.5	32.0	33.2	6.0	36.2	33.5
ND8888-1	10.5	8.5	32.5	9.5	13.5	33.0	8.5	20.2	33.0	7.5	23.2	33.5
ND8888-2	9.0	10.7	35.5	8.0	28.5	35.2	8.0	26.5	33.2	6.5	35.0	34.2
ND8891-3	10.5	8.2	31.5	8.5	19.7	32.2	8.0	28.2	32.2	5.5	34.2	33.5
ND8913-4Russ	10.5	8.2	31.7	9.0	13.2	34.0	9.5	14.7	30.7	9.0	18.2	30.7
ND8914-5Russ	11.0	6.2	29.5	10.0	10.7	32.2	10.0	14.5	30.2	10.0	9.5	28.7
ND8947-2Russ	11.0	5.7	32.2	10.0	8.2	31.5	10.0	13.5	31.5	8.5	18.0	30.7
ND9086-1	10.5	8.5	31.0	9.0	15.5	30.5	8.0	25.0	31.0	7.0	33.5	30.2
ND9279-2R	11.0	6.0	29.0	10.5	10.7	30.5	10.0	13.2	30.2	9.0	16.0	32.0
ND9386-3R	11.0	6.7	30.5	10.0	11.7	27.5	9.5	19.2	28.7	8.0	24.5	29.5
ND9403-16R	9.5	9.5	31.7	7.5	26.2	33.0	6.5	37.5	33.0	6.0	30.2	32.0
ND9403-21R	9.0	14.0	32.0	7.5	25.2	33.7	7.0	27.2	34.5	6.0	31.7	35.2

1/ Color Chart (1-light, 11-dark)

2/ Photovolt - higher numbers are lighter in color

3/ Yield - Percent chip yield

North Dakota Table 5. 1976 Cooking Tests of Varieties and Selections Grown at Park River, North Dakota - 1975.

	Boiling				Baking				
	Sloughing1/ ness2/	Mealiness	Texture3/	Color4/ After Cooking	Color5/ 4 Hours After Cooking	Mealiness	Texture	Color	Flavor6/
Bison	10.0	7.0	7.0	7.5	5.0	7.0	7.0	8.5	7.5
Kennebec	8.5	9.0	10.0	7.0	5.5	8.0	7.5	8.5	8.0
Norchip	9.0	9.0	9.5	9.0	7.0	8.0	8.0	9.5	8.0
Norgold Russet	7.5	9.0	9.0	9.0	6.5	8.0	8.5	9.5	9.0
Norland	9.5	7.5	8.0	9.0	6.0	8.0	8.5	9.0	9.0
Russet Burbank	9.0	8.5	9.5	8.0	7.0	8.5	8.5	8.5	8.5
Viking	10.0	7.5	7.0	10.0	8.5	7.5	7.5	9.0	8.5
ND7878-1	7.5	9.0	9.5	9.0	8.0	8.0	7.5	7.5	7.5
ND8297-1	9.0	8.5	9.0	8.5	6.0	8.5	8.0	9.0	8.5
ND8750-20	8.5	8.0	8.0	9.0	7.5	7.0	7.5	8.5	7.0
ND8751-16	7.0	9.0	10.0	8.5	6.5	8.0	8.5	9.0	7.5
ND8767-10R	10.0	7.5	8.0	9.0	7.0	7.0	6.5	9.5	8.5
ND8850-2	9.0	8.0	8.5	9.0	7.0	8.0	7.5	10.0	6.5
ND8888-1	7.0	8.5	9.0	8.5	7.5	8.0	8.0	9.5	8.5
ND8888-2	8.0	8.5	9.0	8.5	7.0	7.5	8.0	8.5	8.0
ND8891-3	6.0	8.0	8.5	9.5	8.5	8.0	8.5	9.0	8.5
ND8913-4Russ	6.0	8.0	8.5	9.0	8.5	8.5	9.0	9.0	8.5
ND8914-5Russ	8.5	8.5	9.0	9.5	8.0	7.0	8.5	9.0	9.0
ND8947-2Russ	7.5	6.5	6.0	6.5	6.0	5.0	4.0	6.5	4.0
ND9086-1	8.5	8.5	9.0	8.5	7.5	7.5	7.5	8.5	7.5
ND9279-2R	10.0	7.0	6.0	7.5	5.0	5.0	5.0	7.0	4.5
ND9386-3R	10.0	8.0	7.5	9.5	6.0	7.0	7.0	9.5	9.0
ND9403-16R	9.0	7.0	7.5	8.5	6.5	7.5	8.5	8.5	8.5
ND9403-21R	10.0	7.5	7.5	8.0	4.5	7.0	7.0	8.0	8.0

1/ Severe Sloughing-1, No sloughing-10

5/ Dark-1, Very White-10

2/ Not mealy-1, Very dry and mealy-10

6/ Poor flavor-1, Excellent Flavor-10

3/ Poor Texture-1, Good Texture-10

4/ Dark-1, Very White-10

North Dakota Table 6. 1976 Cooking Tests of Varieties and Selections Grown at Grand Forks, North Dakota in 1975.

	Boiling				Baking				
	Sloughing1/ ness2/	Meali- ness2/	Texture3/ Cooking	Color4/ After Cooking	Color5/ 4 Hours After Cooking	Meali- ness	Texture	Color	Flavor6/
Bison	10.0	8.0	7.0	9.0	6.0	8.0	7.0	8.5	8.0
Kennebec	8.0	9.5	9.0	8.0	5.5	8.5	9.0	9.5	9.0
Norchip	8.5	9.0	9.0	9.5	7.5	8.0	7.5	9.5	9.0
Norgold Russet	8.5	8.0	8.5	9.0	8.5	7.5	8.5	9.0	9.0
Norland	9.5	7.5	6.5	8.5	5.5	6.0	6.0	9.0	7.5
Russet Burbank	9.0	7.5	7.5	9.0	8.5	8.0	7.5	6.5	8.0
Viking	9.5	7.0	7.5	10.0	8.5	7.5	7.5	9.5	8.5
ND7878-1	8.0	9.5	9.0	9.0	7.5	7.5	7.0	10.0	7.5
ND8297-1	8.5	7.5	8.5	8.0	6.5	8.5	8.5	8.0	9.5
ND8750-20	8.5	9.0	8.5	9.5	8.5	7.0	7.0	9.0	7.0
ND8751-16	5.5	8.5	8.0	7.5	5.5	8.0	8.0	9.0	9.5
ND8767-10R	10.0	8.5	9.0	8.5	5.0	8.0	7.5	8.0	8.5
ND8850-2	8.0	9.0	9.0	8.0	6.5	8.5	8.0	9.0	9.0
ND8888-1	6.5	8.5	7.5	9.0	7.0	8.5	7.0	9.0	7.5
ND8888-2	9.0	9.0	9.0	9.0	7.0	6.5	7.0	8.5	8.0
ND8891-3	8.0	9.0	9.5	9.0	8.5	8.5	7.5	9.0	9.0
ND8913-4Russ	6.5	8.5	8.5	10.0	9.5	6.5	6.0	9.0	6.5
ND8914-5Russ	9.0	8.5	8.5	9.0	8.0	7.5	7.5	9.0	9.0
ND8947-2Russ	6.5	6.0	8.5	6.5	7.0	4.5	4.0	4.5	5.0
ND9086-1	8.5	8.5	9.5	9.5	9.5	7.0	7.0	9.0	9.0
ND9279-2R	8.5	8.0	7.5	6.0	3.5	4.5	4.0	7.5	4.0
ND9386-3R	9.0	5.0	5.0	10.0	8.0	6.5	5.5	8.5	8.0
ND9403-16R	9.5	9.0	9.5	8.0	7.5	8.0	7.5	9.0	9.5
ND9403-21R	9.5	6.5	5.0	7.0	7.0	6.5	6.5	8.0	8.0

1/ Severe Sloughing-1, No sloughing-10

2/ Not mealy-1, Very dry and mealy-10

3/ Poor texture 1, Good texture-10

4/ Dark-1, Very White-10

5/ Dark-1, Very White-10

6/ Poor flavor-1, Excellent flavor-10

OHIO

L. L. Sanford^{1/} and T. Ladd^{2/}

Testing for Resistance to Potato Leafhoppers

Included in this test were 17 previously tested clones, one susceptible check variety, Cobbler, and 70 1st year, untested clones. They were planted on the Ohio Agricultural Research and Development Center, Wooster, Ohio in 5-hill plots arranged in augmented R.C.B. design. The previously tested clones were replicated 4 times whereas the untested clones were not replicated.

Leafhopper nymphs were counted on 19 July with two 45 sec counts per plot. Hopperburn damage was rated visually on 4 August.

This year leafhopper infestation level was high. The variability of the counts within plots was somewhat higher than usual (CV 32%). Hopperburn and nymph counts were significantly associated over clones ($r = .68$, $P.01$). Hopperburn symptoms were quite typical.

None of the 2nd or 3rd year clones (B7196-40 to B7678-17, Table 1) had nymph counts as low as the most resistant clones. B3692-4, B5052-7, B7145-3, B6558-2, and B6712-9 continue to be the most resistant to build-up of nymph infestation. B6987-56 (Atlantic) had the expected high number of nymphs but showed more hopperburn than expected. This clone is usually quite resistant to hopperburn damage.

Of the 70 1st year clones, 23 were selected on the basis of lower nymph counts for retesting in 1977 (Table 2). For the 70 clones, the mean nymph count was 33.6, for the 23 selected clones 19.7, for the replicated clones 29.5, and for Cobbler 67.7.

^{1/} Beltsville Agricultural Research Center-West, Beltsville, MD.

^{2/} Ohio Agricultural Research and Development Center, Wooster, OH.

Maryland
Table 1. Leafhopper nymph counts and hopperburn for replicated clones,
Wooster, Ohio 1976.

Clone	Nymph Count ^{1/}		Pct. Hopperburn ^{2/}	
	Mean	Rank	Mean	Rank
B3692-4	19.0	3	46	6
B5052-7	16.1	2	37	2.5
B5141-6	28.5	8	50	8
B6558-2	22.7	5	31	1
B6712-9	21.6	4	37	2.5
B6930-16	29.9	9	60	10.5
B6987-56	46.7	17	65	13
BR7103-7	30.7	11	69	15.5
B7132-27	25.9	6	69	15.5
B7138-8	43.4	16	41	4
B7145-3	14.0	1	46	6
B7196-40	27.2	7	65	13
B7572-2	30.6	10	56	9
B7608-4	39.7	14	86	17
B7621-10	34.6	13	65	13
B7632-3	40.2	15	46	6
B7678-17	31.0	12	60	10.5
Cobbler	67.7	18	90	18
S.E.				
Mean Diff.	6.7			

^{1/} Nymphs per 45 sec count, 19 July; mean 2 counts per plot, 4 plots.

^{2/} Pct. defoliation, 4 August; mean 4 readings.

Table 2. Leafhopper nymph counts and hopperburn for non-replicated clones, Wooster, Ohio, 1976.

Clone	Nymph Count ^{1/}		Pct. Hopperburn ^{2/}	
	Mean	Rank	Mean	Rank
B7825-5	47.0	56	60	25
B7828-9	36.0	41.5	88	54.5
B7830-4*	20.5	13	41	12.0
B7832-2	36.5	43	88	54.5
B7838-2	56.5	64	94	61
B7839-7	45.0	54.5	100	69.5
B7845-4*	12.5	7	77	40
-6	49.5	59	88	54.5
-10	21.0	16	77	40
-14	73.0	70	77	40
-17	26.0	23	77	40
-19*	21.0	16	41	12
-21	42.0	50	88	54.5
-26	57.5	65	93	65
-29	41.0	49	88	54.5
B7848-2*	28.5	28.5	60	25
B7858-5	53.0	62	98	65
-6	26.0	23	98	65
B7859-2	29.5	31	88	54.5
B7861-2*	3.5	1	24	3
B7863-1	16.0	10	41	12
-2*	24.5	19.5	60	25
B7863-6*	30.5	32.5	41	12

Continued

Table 2 - Continued (2)

Clone	Nymph Count <u>1/</u>		Pct. Hopperburn <u>2/</u>	
	Mean	Rank	Mean	Rank
B7865-12*	24.5	19.5	41	12
B7866-3*	16.5	11	24	3
B7871-5*	28.0	26.5	60	25
B7872-7	37.0	44	88	54.5
B7888-7	38.5	46	60	25
-8*	10.5	5	41	12
B7888-9	31.5	37.5	60	25
B7897-1	51.5	61	98	65
-3	48.0	58	98	65
B7905-2*	8.0	2	41	12
B7910A-6*	10.0	4	41	12
B7913-1*	11.5	6	41	12
B7914-2*	31.0	35	41	12
B7918-3	42.5	51	88	54.5
B7925-3	50.5	60	88	54.5
B7927-1	31.0	35	60	25
B7929-3	28.0	26.5	60	25
-5	44.0	52	77	40
-11	25.0	21	98	65
B7930-2	21.5	18	77	40
B7939-4	44.5	53	41	12
B7957-5	33.5	39	77	40
B7978-1*	13.5	8	24	3
B8004-8	36.0	41.5	88	54.5
B8018-2*	15.5	9	24	3

Continued

Table 2. - Continued (3)

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Clone	Nymph Count ^{1/}		Pct. Hopperburn ^{2/}	
	Mean	Rank	Mean	Rank
B8019-4*	20.5	13	41	12
-7*	20.5	13	24	3
B8024-1	47.5	57	100	69.5
B8036-1	29.0	30	77	40
-4*	21.0	16	60	25
B8050-4	40.0	47.5	60	25
B8073-3	70.5	69	77	40
B8086-3*	31.0	35	60	25
B8087-6	26.0	23	77	40
B8088-2	34.0	40	60	25
B8091-8	38.0	45	77	40
B8101-3	70.0	68	77	40
B8108-3	31.5	37.5	77	40
B8123-3*	40.0	47.5	41	12
B8123-11	64.5	67	77	40
B8123-12	56.0	63	88	54.5
B8125-5	27.5	25	88	54.5
B8131-1	45.0	54.5	77	40
B8132-4	61.5	66	98	65
B8140-1*	9.5	3	60	25
B8148-4	28.5	28.5	77	40
B8154-9	30.5	32.5	77	40
S.E.	13.4			

^{1/} Nymphs per 45 sec count; mean of 2 counts on one plot; 19 July.^{2/} Pct. Defoliation, 4 Aug.; one reading

* Selected for retesting in 1977.

OHIO

Alvin R. Mosley, F. I. Lower, E. C. Wittmeyer and W. A. Gould

Potato Cultivar Trials, 1976

Forty-five potato varieties and seedlings were evaluated in Ohio in 1976. Most of this work was done on commercial potato farms using commercial cultural and pest control practices. The work was sponsored by the Department of Horticulture and the Ohio State University in cooperation with the Ohio Potato Growers Association and seven commercial growers.

State-Wide Trial. Eight entries were evaluated on each of six commercial farms across Ohio.

<u>Location</u>	<u>Grower</u>
1--Beach City	Beckers Falls Farm
2--Hanoverton	Harold Thompson
3--Mantua	Frank Goodell & Sons
4--Smithville	Galen Moomaw
5--Defiance	Chase Farms
6--Lisbon	Tritten Brothers

Each variety was replicated three times at each location; individual plots were double rows fifty feet long. Twenty-six additional observational entries were evaluated at locations 2 and 6. Observational selections were replicated only twice and plots were double rows twenty-five feet long.

Tubers were dug by machine, allowed to air-dry in the field for approximately thirty minutes, weighed and a fifty-lb. sample was then graded. A fifteen-lb. sub-sample from each major plot was chipped in the Horticulture Pilot Plant at Ohio State University. Only promising observational entries were chipped.

Results are summarized in Tables 1-3. Snowchip led in yield across all locations and chipped well. Tubers were slightly rough with considerable shouldering, however. W 718 yielded well and tubers were attractive but prone to excessive hollow heart. Centennial produced lowest yields at each of the six farms and showed consistently poor stands.

Atlantic yielded well among the observational entries and appeared to have promise. Tubers were quite susceptible to hollow heart and possibly heat necrosis at some locations. ND8891-3 appeared to be an outstanding selection with attractive, slightly oblong tubers and chipped well in preliminary tests.

Marietta Early-Market Trial. Twelve potato varieties and seedlings were evaluated for late summer cropping on the Louis Huck farm at Marietta in southern Ohio. Double-row plots fifty feet long and replicated three times were planted on April 16 in Wheeling gravelly loam and harvested on August 3 immediately after vines were shredded. The crop was grown using cultural and pest control measures common to the area.

Results are summarized in Table 4. W 710 produced highest yields as it did in 1975. W 710 appeared to have considerable promise as an early market potato when compared to the standard early cultivar Superior. Centennial outyielded the later-maturing cultivars Kennebec, Katahdin and 6CX6 but did not produce economic yields.

Celeryville Muck Trial. Ten potato varieties and seedlings were evaluated on deep muck at the Celeryville OARDC Muck Crops Substation. Plots were double rows twenty-five feet long replicated five times. The crop was grown using standard cultural and pest control methods. Results are summarized in Table 5.

W 718 led in yield in 1976 in contrast to relatively poor yields for this seedling in 1975. Tubers were bright and attractive but prone to hollow heart. The russets Centennial and NDA 8451-3 yielded poorly and will not be tested further. Likewise, W 710 and Wischip appeared to have little promise despite excellent yields by W 710 in the early plots at Marietta.

Streetsboro Trial. Twenty-seven potato varieties and seedlings were evaluated for total yield and susceptibility to ozone damage on a commercial potato farm at Streetsboro in 1976. The crop was grown using typical commercial methods. Plots were double rows ten feet long replicated four times. Results are summarized in Table 6.

Several seedlings produced excellent yields at Streetsboro; chief among these was ND8891-3. ND8891-3 was relatively resistant to ozone damage compared to other North Dakota Selections. Atlantic also appeared to have excellent promise except for a tendency toward hollow heart.

Ohio Table 1. Average U.S. No. 1 yields in cwt. per acre of eight potato varieties and seedlings grown at six locations in Ohio--1976

Entry ⁽¹⁾	L O C A T I O N						Average
	1	2	3	4	5	6	
Snowchip	565	333	249	523	331	414	402
W 718	468	400	255	526	308	251	385
Kennebec	428	258	330	460	262	314	343
Superior	396	196	242	408	238	360	342
Katahdin	379	367	213	444	310	345	319
6CX6	363	319	278	380	263	309	307
Norchip	296	196	212	366	290	280	273
Centennial	130	165	65	195	202	179	156
Average	378	280	231	427	276	319	316
LSD .05 ⁽²⁾							

1/ Entries ranked according to average yields across all locations.

2/ LSD .05: Locations = 34.8, Varieties = 40.2.

Ohio Table 2. Average percent stand, grade, tuber size, specific gravity, and chip color of eight potato varieties and seedlings grown at six locations in Ohio--1976

Variety	Percent Stand	Percent			Avg. Tuber Wt., lbs.	Specific Gravity	Chip ⁽²⁾ Color
		U.S. No. 1	B-Size	Culls			
Snowchip	90	89.0	3.3	7.5	0.43	1.074	46.1
W 718	87	88.5	3.1	8.1	0.47	1.067	43.9
Kennebec	95	78.0	2.3	19.6	0.47	1.075	45.5
Superior	94	90.3	3.2	6.5	0.39	1.071	44.4
Katahdin	88	89.3	2.9	7.8	0.47	1.073	43.2
6CX6	93	87.5	4.1	8.4	0.39	1.080	46.8
Norchip	92	80.3	4.5	15.1	0.36	1.075	46.3
Centennial	84	82.7	10.2	5.5	0.31	1.069	36.0
Average	90	85.7	4.2	9.8	0.41	1.073	44.0
LSD .05	3.1	3.4	1.2	3.1	N/A	0.002	2.2

1/ Potato hydrometer method.

2/ Agron red.

Ohio Table 3. Average percent stand, U.S. No. 1 yield, and grade of twenty-six potato varieties and seedlings grown in observational plots at two locations in Ohio--1976

Entry ⁽¹⁾	Percent Stand	U. S. No. 1		Avg. Tuber Wt., lb.
		Cwt/A	%	
Atlantic	92	383	90	.48
W 710	92	382	88	.43
W 721	91	356	88	.37
Late Superior	97	334	84	.48
CA 46-11	80	330	77	.64
Late Hi-Plains	93	326	76	.43
MS 709	94	325	77	.51
MS 711-8	95	323	83	.47
ND 8891-2	94	322	81	.41
W 723 ⁽³⁾	98	321	80	.41
W 726	87	321	69	.57
CA 55-24	94	315	86	.54
Norgold 10	99	300	81	.44
FL 162 ⁽³⁾	92	287	83	.31
Norgold 35	94	284	81	.46
Alma (F61025)	90	274	76	.53
AK 28-8 ⁽²⁾	92	272	81	.46
Wischip	92	262	87	.33
Neb. 42-1	80	257	77	.33
Anoka	95	234	85	.40
W 623	92	233	78	.43
WC 230-14	94	227	82	.42
ND 8913-4	97	224	73	.31
W 731	90	220	69	.47
ND 8751-16	95	217	67	.33
ND 8914-5	96	137	55	.43
Average	93	285	80	.43

1/ Entries ranked according to U.S. No. 1 yield.

2/ Location No. 5 only.

3/ Location No. 6 only.

Ohio Table 4. Yield, grade, and percent stand of twelve potato varieties and seedlings grown for late summer harvest at Marietta, Ohio--1976

Entry	U. S. No. 1		Percent ⁽¹⁾ B-Size	Percent Culls	Percent Stand
	Cwt/A	Percent			
W 710	372	80	7.2	12.8	99
Superior	342	86	6.8	7.4	96
Anoka	320	85	9.4	5.6	88
W 718	295	85	7.4	7.4	87
Wischip	290	81	14.8	3.8	95
W 623	263	79	9.2	11.8	92
Norchip	243	72	16.0	11.6	95
W 721	219	71	21.8	7.6	96
Centennial	210	79	13.0	7.8	83
Kennebec	183	69	13.8	17.4	92
Katahdin	162	73	11.6	15.0	88
6CX6	113	63	30.8	6.6	98
Average	251	77	13.5	9.6	94
LSD .05	49.9	6.6	4.7	5.4	6.7

1/ 1 7/8-inch screen.

Ohio Table 5. Yield, grade, tuber size, percent stand and chip color of ten potato varieties and seedlings grown on muck at Celeryville, Ohio--1976

Entry	U. S. No. 1		B-Size %	Culls %	Avg. Tuber Size #	% Stand	Chip ⁽¹⁾ Color
	cwt/A	%					
W 718	337	85.0	5.6	9.5	0.46	68.9	43
Anoka	254	83.8	7.1	9.0	0.40	83.6	37
Superior	235	80.6	9.2	10.3	0.37	88.7	39
Katahdin	226	79.8	7.3	12.8	0.37	92.4	36
6CX6	228	78.0	8.6	13.4	0.35	90.9	47
Norchip	211	71.6	9.1	19.4	0.37	82.9	46
W 710	213	79.0	14.2	6.5	0.36	90.2	39
Centennial	201	82.6	11.0	6.4	0.43	79.9	27
Wischip	198	83.2	13.8	2.9	0.30	88.7	47
NDA 8451-3	169	70.6	14.4	14.9	0.50	69.6	36
Average	229	79.4	10.0	10.5	0.39	83.6	40
LSD .05	36.9	4.3	2.7	3.2	0.04	----	4.3

1/ Agtron red

Ohio Table 6. Average total yield and ozone injury ratings of twenty-seven potato varieties and seedlings grown on a commercial potato farm at Streetsboro, Ohio--1976

Variety	Total Yield, cwt/A	Ozone ⁽¹⁾ Damage
ND 8891-3	472	1.50
W 721	455	1.75
Kennebec	454	1.87
MS 709	422	2.37
W 731	420	3.00
Atlantic	409	2.87
W 723	393	2.75
W 726	392	2.87
Shurchip	389	3.13
MS 711-8	381	2.25
ND 8751-16	380	4.12
W 623	367	2.87
Katahdin	357	2.75
Superior	338	2.25
WC 230-14	324	2.50
Hi-Plains	311	2.75
Alma	300	1.87
ND 8914-5R	298	3.50
Anoka	291	3.62
Norchip	286	3.70
Norland	284	4.75
ND 8914-4R	274	4.25
A 6789-7	268	0.75
Wischip	250	4.00
Centennial	212	4.13
NDA 8451-3	198	3.00
Average	344	2.32
LSD .05	92	0.89

^{1/} Ratings on August 27. 0 = No visible symptoms; 5 = severe damage with noticeable defoliation.

OREGON

Wm. G. Hoyman

Eastern Oregon Farming Company

Variety Trial. Morrow County, Oregon, has had a phenomenal increase in its potato acreage the past few years. The center pivot system of irrigation with ample water from the Columbia River has made it possible to farm this "sage brush land". Only a small portion of the many thousands of available acres is being farmed. Of several farms recently established, the largest is 23,000 acres. A limited experience has shown that clones grown here may react differently than when grown at other locations. Apparently, this may be due to more precise control of soil preparation, fertilization, soil moisture, insects, tuber size and quality, vine killing and harvesting operations. Soil type and a long growing season are other contributing factors. Most all operations tend to "revolve" around the center pivot system. The 1976 variety trial included three clones from Idaho, one from Washington and Russet Burbank. The seed was cut by hand April 4, 1976, treated with Captan dust and planted the following day in loamy sand soil in circle No. 61. Each of the five clones was planted in adjoining rows 100 feet long. The seed was spaced nine inches within rows that were 34 inches apart. Fertilizer containing 34, 15, 183, 4.8 and 0.91 pounds per acre of N, P, K, B and Zn, respectively, were disced in previous to planting. An additional 130 pounds of N and 162 pounds of P per acre were banded at planting plus 17 pounds of S. Forty-nine inches of water were applied through the center pivot system from the forepart of May until the latter part of August. During this 4-month period N, P and S were metered through the system at the rate of 486, 25 and 32 pounds per acre, respectively. The system made one revolution every 30 hours. The vines were chemically killed September 3 and 100 hills of each clone harvested September 19. The converted yields and other data are given in the table.

Oregon Table 1. Tuber data of russet-skin clones grown under center pivot irrigation in Morrow County, Oregon.

Clone	Average number tubers per hill	Total cwt. per acre	Percent of total weight			Specific gravity	
			<4 oz.	4-12 oz.	>12 oz.		
A6371-2	16.1	922	28.8	67.1	4.1	0.0	1.087
A68678-1	10.0	1,127	4.6	51.6	43.8	3.5	1.093
A68681-1	16.2	799	25.8	64.4	9.8	0.0	1.079
W330-1	10.1	655	19.2	72.0	8.8	0.0	1.067
Russet Burbank	14.6	840	23.2	74.4	2.4	0.0	1.088

Tubers of all clones were oblong and had eyes flush with the attractive russet skin. A6371-2 had very large vines and excessive vegetation might cause production problems when the crop is irrigated by the center pivot system and provided with ample fertilizer. The most imminent peril is Sclerotinia sclerotiorum. This soil-borne pathogen is present in native soils of the area. A6371-2 produced many small tubers - 28.8 percent of its total weight under 4 ounces. A68681-1 and Russet Burbank were inclined to do the same with 25.8 and 23.2 percent, respectively. Russet Burbank only had 2.4 percent of its total weight over 12 ounces and A6371-2 was also low with 4.1 percent. In contrast, A68678-1 only had 4.6 percent of its total weight under 4 ounces and 43.8 percent over 12 ounces. This clone had the highest yield, the highest specific gravity and the uniform, blocky, oblong tuber shape suitable for french fries. The 56.3 tons per acre yield is probably a record in the Pacific Northwest. Even with nearly half of its total weight over 12 ounces, there was only 3.5 percent of this weight with hollow tubers.

PENNSYLVANIA

J. D. Harrington, D. R. MacKenzie, and R. H. Cole

Potato variety trials were conducted at three locations in Pennsylvania in 1976. Location of experimental sites, cultural information, and initial determination dates are presented in Pennsylvania Table 1.

Pennsylvania Table 1. Experimental sites, cultural information, and determination dates for potato varieties and seedlings grown in Pennsylvania, 1976.

<u>County</u>	<u>Cooperator</u>	<u>Pltg. Date</u>	<u>Fert. at Pltg., — lbs/A —</u>			<u>Maturity</u>
			<u>N</u>	<u>P₂O₅</u>	<u>K₂O</u>	
Cambria (C)	Joseph Leiden	5/12	150	150	150	9/9
Lancaster (SE)	Agronomy Dept.	4/21	180	120	120	9/8
Schuylkill (E)	Clarence Kershner	5/5	270	470	470	9/2

<u>County</u>	<u>Harvest</u>	<u>No. of Days from Pltg. to Harvest</u>	<u>Graded</u>	<u>Spec. Grav. (approx.)</u>	<u>Chipped</u>
Cambria	10/5	146	10/27	11/10	12/1
Lancaster	9/24	156	10/21	11/10	12/1
Schuylkill	9/30	141	10/12	11/10	12/2

Soils at experimental sites were deep, heavy (silt loam), and well-drained. Soil pH ranged from 5.5 to 6.6. Prior to hand-planting, rows were furrowed-out 3 feet apart and simultaneously treated with a systemic insecticide and commercial fertilizer. Normal cultural practices were maintained throughout the growing season. Soil moisture was not limiting.

Seed for 21 of the named varieties and numbered seedling selections was obtained from the Maine State Seed Board at Sangerville, Maine. Seed of AK11-68-4-71, AK37-19, and Snowchip was obtained from C. H. Dearborn, USDA-ARS, in Alaska.

All varietal seed pieces (4-cut) were planted 8 inches apart, except B7147-8 and B7196-74, within 25-foot single-row plots with a 3-foot break between plots. Line B7147-8 was spaced 10 inches apart, whereas B7196-74 was spaced 12 inches apart. A completely randomized block design with four replications was employed.

Information on the origin of the two early-, three medium-, and 19 late-maturing varieties and seedlings, in addition to tuber characteristics after grading and washing (composite of four reps), is included in Pennsylvania Table 2.

Production and Quality Indices

Varietal maturity, tuber production, and tuber quality indices were obtained as follows:

Maturity: Final maturity grouping (early, medium, late) was determined by percent of vegetative tops naturally dead in September.

Total yield, cwt/A: Tubers 1-1/2 inches and larger in diameter were harvested from plots and weighed; total plot weights were converted to hundredweight yields per acre.

Percentage of total yield: Percentage of tubers above 1-7/8 and 2-1/2 inches in diameter, Size B (1-1/2 to 2-1/4 inches), Bakers (>3 inches) was determined from total yield based upon weights recorded by the different size classes during the mechanical sizing procedure. Size A shall contain at least 40 percent of the potatoes 2-1/2 inches or larger in diameter.

Specific gravity: Determined from approximately five-pound samples by the air and water method as soon as tuber temperatures had equalized with water temperature in the testing room.

Total solids: Calculated by use of Von Scheele's regression equations.

Chip color: Ratings were made subjectively using PCII Reference Color Chart 1206-U. Lower indices are lighter in color. Varieties with ratings above 7.0 are considered unacceptable.

Tuber quality and chip color indices were determined on potatoes 2-1/2 inches in diameter size at Aroostook Farm, Presque Isle, Maine. After harvest, tubers were stored in dry barns until grading without facilities for control of temperature or humidity. Graded tuber samples for chips were stored at room conditions before chipping. Data were analyzed by the Computing and Processing Services at the University of Maine, Orono, Maine.

Results

Production and tuber quality indices for the 24 potato varieties and seedlings grown at three locations, i.e., Cambria County (central), Lancaster County (southeast), and Schuylkill County (east), are reported in Pennsylvania Tables 3, 4, 5, and 6. In Pennsylvania Table 7 is presented tuber characteristics on November 17 after storage and grading.

Pennsylvania Table 2. Origin, maturity and tuber characteristics, 1976.

Seedling No. or Variety	Origin	-----TUBER CHARACTERISTICS-----			
		Mat ^{1/}	Skin Color ^{2/}	Shape ^{3/}	Eye Depth ^{4/}
AK11-68-4-71	USDA-ARS, Alaska A.E.S.	L	Cr B	Cyl-Ob	S
AK37-19	USDA-ARS, Alaska A.E.S.	L	Cr B	El-Ob	M
B7104-10	USDA-ARS	L	Cr B	El-Ob	S
B7147-8	USDA-ARS	M	Ru	Cyl	S
B7167-2	USDA-ARS	L	Cr B	Ob	S
B7196-74	USDA-ARS	L	Ru	Cyl-Ob	S
B7485-6	USDA-ARS	L	Ru	Cyl-Ob	S
BR6316-5	USDA, Camp. Inst. at Riv., N.J.	L	Cr B	El-Ob	S
BR6863-3	USDA, Camp. Inst. at Riv., N.J.	E	Cr B	El-Ro	S
BR7088-18	USDA, Camp. Inst. at Riv., N.J.	E	Cr B	El-Ro	S
BR7093-23	USDA, Camp. Inst. at Riv., N.J.	M	Cr B	El-Ro	S
BR7093-42	USDA, Camp. Inst. at Riv., N.J.	L	Cr B	El-Ob	S
CA02-7	Campbell Institute	L	Cr B	El-Ob	S
CA46-11	Campbell Institute	L	Cr B	Ob	S
F6102-5	Agri. Can. at New Brunswick	L	Cr B	Ob	S
F6208	Agri. Can. at New Brunswick	L	Cr B	El	S
Atlantic (B6987-56)	USDA-ARS	L	Ru	El-Ro	M
Belleisle	Agri. Can. at New Brunswick	L	Cr B	Ob	S
Green Mountain	Vermont	L	Cr B	El-Ob	M-D
Katahdin	USDA-ARS	L	Cr B	El-Ro	S
Kennebec	USDA-ARS	L	Cr B	El-Ob	S
Norchip	North Dakota A.E.S.	M	Cr B	El-Ro	S
Penn 71	Pa. A.E.S., Plant Path. Dept.	L	Cr B	El-Ob	M
Snowchip	USDA-ARS, Alaska A.E.S.	L	Cr B	El-Ro	M

^{1/} E-early maturity, M-medium maturity, L-late maturity

^{2/} Cr B-creamy buff, Ru-russet

^{3/} El-elliptical, Ob-oblong, Ro-round, Cyl-cylindrical

^{4/} S-shallow, M-medium, D-deep

Pennsylvania Table 3. Yield, percentage of yield in 4 market grade size classes, specific gravity, and total solids for 24 potato varieties grown in Cambria County (central), 1976.

Variety ¹	Yield above 1½ inches, Cwt./A.	Percentage of yield Above 1-7/8 inches	Percentage of yield Above 2-1/2 inches	Percent Size B, 1½ - 2¼ inches	Percent Bakers, >3 inches	Specific gravity	Percentage total solids
F6208	473	95.8	85.5	14.5	54.5	1.091	22.54
CA02-7	469	96.3	82.0	18.0	36.7	1.089	22.11
Green Mountain	440	95.7	83.1	16.9	31.1	1.091	22.54
Kennebec	440	97.1	86.3	13.7	31.4	1.085	21.27
AK11-68-4-71	435	96.4	85.1	14.9	30.4	1.091	22.54
Snowchip	409	96.3	84.9	15.1	45.5	1.086	21.48
BR7093-23	392	93.9	76.3	23.7	16.8	1.076	19.37
BR6316-5	390	96.3	80.4	19.6	28.1	1.094	23.17
Penn 71	390	97.4	88.1	11.9	38.2	1.078	19.79
Atlantic	384	96.9	83.5	16.5	31.5	1.097	23.80
Norchip	369	94.9	73.0	27.0	19.8	1.079	20.00
Katahdin	355	96.6	83.5	16.6	27.9	1.077	19.58
BR7088-18	349	95.9	77.9	22.1	28.2	1.090	22.33
BR6863-3	338	95.4	84.7	15.3	39.3	1.089	22.11
B7104-10	330	93.9	75.8	24.3	20.7	1.070	18.10
BR7093-42	318	98.3	88.0	12.0	46.3	1.076	19.37
F6102-5	294	94.9	78.3	21.7	31.9	1.088	21.90
Belleisle	276 *	96.5	83.6	16.5	25.7	1.093	22.96
B7196-74	265	90.3	61.8	38.3	6.4	1.072	18.53
AK37-19	261	94.5	71.4	28.6	18.5	1.098	24.01
B7583-6	261	92.8	71.0	29.1	7.8	1.088	21.90
CA46-11	261	93.2	68.3	31.8	14.9	1.071	18.32
B7167-2	233	89.0	53.1	46.9	6.4	1.079	20.00
B7147-8	193	90.4	46.7	53.4	0.8	1.086	21.48
Bayes L.S.D. (0.05)	86					0.006	

¹Planted - May 12; harvested - October 5, 1976

Seedpiece spacing: B7147-8 spaced 10 inches apart, B7196-74 spaced 12 inches apart; all other varieties spaced 8 inches apart

Fertilization: 150-150-150

Pennsylvania Table 4. Yield, percentage of yield in 4 market grade sizes, specific gravity, and total solids for 24 potato varieties grown in Lancaster County (southeast), 1976.

Variety ¹	Yield Above 1½ inches, Cwt./A.	Percentage of yield Above 1-7/8 inches	Percentage of yield Above 2½ inches	Percent Size B, 1½ - 2¼ inches	Percent Bakers, >3 inches	Specific gravity	Percentage total solids
B7104-10	455	92.6	35.2	28.3	15.2	1.078	19.79
CA46-11	393	96.4	47.2	22.0	22.1	1.074	18.95
Norchip	367	93.6	27.6	32.9	10.8	1.071	18.32
BR7088-18	346	95.7	44.5	19.5	23.1	1.085	21.27
Kennebec	324	92.7	17.1	34.6	4.1	1.068	17.68
Snowchip	308	92.5	30.9	32.2	14.9	1.070	18.10
Atlantic	305	90.7	24.3	42.2	10.8	1.081	20.43
Penn 71	305	96.7	30.0	21.4	4.7	1.064	16.84
Katahdin	304	94.0	34.2	24.6	13.4	1.061	16.21
Belleisle	292	92.8	33.2	29.6	16.3	1.077	19.58
BR7093-23	282	87.3	26.3	40.1	14.5	1.061	16.21
F6208	271	90.9	28.2	26.9	13.8	1.071	18.32
F6102-5	259	91.5	37.4	31.4	21.4	1.067	17.47
AK11-68-4-71	258	88.3	10.1	47.0	4.8	1.071	18.32
B7167-2	247	89.9	7.8	54.0	0.0	1.077	19.58
B7583-6	246	84.6	4.5	56.4	0.0	1.077	19.58
BR7093-42	240	96.6	63.2	13.4	48.3	1.064	16.84
BR6863-3	224	93.4	36.1	25.7	11.1	1.072	18.53
BE6316-5	204	91.7	17.0	46.0	7.0	1.076	19.37
Green Mountain	203	84.1	9.0	52.3	3.0	1.075	19.16
B7196-74	200	88.6	9.9	45.1	2.6	1.066	17.26
B7147-8	179	84.9	2.5	54.2	1.0	1.072	18.53
AK37-19	162	80.6	5.2	66.9	1.9	1.084	21.06
CA02-7	155	81.8	12.2	59.2	4.6	1.066	17.26
Bayes L.S.D. (0.05)	79					0.005	

¹Planted-April 21; harvested - September 24, 1976

Seedpiece spacing: B7147-8 spaced 10 inches apart, B7196-84 spaced 12 inches apart; all other varieties spaced 8 inches apart

Fertilization: 180-120-120

Pennsylvania Table 5. Yield, percentage of yield in 4 market grade sizes, specific gravity, and total solids for 24 potato varieties grown in Schuylkill County (east), 1976.

<u>Variety</u> ¹	<u>Yield</u> <u>Above</u> <u>1½ inches,</u> <u>Cwt./A.</u>	<u>Percentage</u> <u>of yield</u> <u>Above 1-7/8</u> <u>inches</u>	<u>Percentage</u> <u>of yield</u> <u>Above 2½</u> <u>inches</u>	<u>Percent</u> <u>Size B,</u> <u>1½ - 2¼</u> <u>inches</u>	<u>Percent</u> <u>Bakers,</u> <u>>3</u> <u>inches</u>	<u>Specific</u> <u>gravity</u>	<u>Percentage</u> <u>total</u> <u>solids</u>
B7104-10	547	88.6	40.0	29.8	18.8	1.059	15.78
Penn 71	515	94.3	54.1	19.7	30.3	1.064	16.84
F6208	514	91.1	51.4	26.0	35.0	1.076	19.37
BR7088-18	497	93.9	43.1	25.1	23.4	1.077	19.58
CA46-11	487	90.8	38.4	27.4	14.9	1.063	16.63
BR7093-23	468	88.9	32.1	41.8	15.0	1.067	17.47
Atlantic	446	89.9	30.1	35.7	15.9	1.077	19.58
Katahdin	413	90.0	35.8	31.8	16.6	1.057	15.38
Kennebec	411	91.3	41.9	27.9	21.1	1.062	16.42
Norchip	405	90.7	30.5	33.5	13.1	1.063	16.63
Green Mountain	401	89.1	25.9	38.4	10.4	1.080	20.21
Snowchip	357	86.0	27.8	42.6	14.4	1.064	16.84
AK11-68-4-71	351	86.5	17.9	40.5	3.5	1.069	17.89
Belleisle	345	89.4	36.1	35.7	19.6	1.071	18.32
B7583-6	342	89.2	34.6	33.5	15.8	1.074	18.95
F6102-5	342	89.6	33.6	34.3	17.2	1.064	16.84
B7167-2	326	82.3	18.6	49.1	7.8	1.071	18.32
BR6863-5	323	92.7	47.3	23.2	23.4	1.067	17.47
BR7093-42	314	93.0	53.0	24.3	36.1	1.060	15.99
B7147-8	299	85.6	10.3	48.6	4.0	1.069	17.89
AK37-19	276	86.5	18.0	49.2	3.7	1.076	19.37
BR6316-5	263	85.1	34.5	45.2	10.8	1.068	17.68
B7196-74	254	83.2	15.0	48.5	7.2	1.063	16.63
CA02-7	164	81.6	20.5	51.1	9.1	1.062	16.42
Bayes L.S.D. (0.05)	120					0.006	

¹Planted - May 5; harvested - September 30, 1976

Seedpiece spacing: B7147-8 spaced 10 inches apart, B7196-74 spaced 12 inches apart; all other varieties spaced 8 inches apart

Fertilization: 270-470-470

Pennsylvania Table 6. Chip color indices for potato varieties grown in Cambria, Lancaster, and Schuylkill Counties, 1976.

Variety	County and Chip Color ¹		
	Cambria	Lancaster	Schuylkill
AK11-68-4-71	7.4	7.6	7.1
AK37-19	6.7	6.6	6.4
B7104-10	6.9	6.3	7.3
B7147-8	7.6	7.9	6.7
B7167-2	5.8	6.1	6.4
B7196-74	7.5	8.1	7.0
B7583-6	7.7	7.8	6.8
BR6316-5	7.5	6.5	6.5
BR6863-3	6.0	6.4	6.0
BR7088-18	6.2	6.2	5.6
BR7093-23	6.4	6.9	6.4
BR7093-42	6.8	6.0	5.7
CA02-7	6.5	6.3	6.5
CA46-11	6.4	6.1	5.6
F6102-5	6.8	6.8	6.1
F6208	8.1	7.9	7.2
Atlantic	6.7	6.2	6.1
Belleisle	6.7	6.9	6.7
Green Mountain	8.3	8.3	7.4
Katahdin	7.4	7.5	7.2
Kennebec	7.0	6.7	6.3
Norchip	6.5	5.9	6.0
Penn 71	6.4	6.7	5.7
Snowchip	6.1	6.0	5.8
Bayes L.S.D. (0.05)	1.2	0.8	0.9

¹Chips with lower indices are lighter in color.

Pennsylvania Table 7. Tuber characteristics after storage and grading at three locations, 1976^{1/}.

Seedling No. or Variety	Cambria County (central)	Lancaster County (southeast)	Schuylkill County (east)
AK11-68-4-71	few shatter bruise, fair shape, some russet	some russet, few rough	some russet, fair shape
AK37-19	some shatter bruise, cuts, some rhizoctonia	some russet, cracks, few sprouts at bud end	some rhizoctonia, some russet, sprouts at bud end, rough
B7104-10	rhizoctonia, growth cracks, tubers sprouted	some rhizoctonia, sprouted at bud end	sprouted, growth cracks
B7147-8	attractive	attractive, some pointed on ends	attractive
B7167-2	fairly attractive, skin discoloration, sprouted at bud end	sprouted, some rhizoctonia, scab, rough	some russet, cuts, sprouted, skin discoloration
B7196-74	attractive	attractive, some pointed on ends	attractive
B7583-6	flat, shatter bruise	fairly attractive	fairly attractive
BR6316-5	few shatter bruise, some russet, some greening	some russet, some skin discoloration	some russet, some skin discoloration, some cuts
BR6863-3	some russet, some rhizoctonia	some russet, attractive, few sprouts at bud end, fair shape	some russet, rhizoctonia, sprouted
BR7088-18	fair shape, rhizoctonia	some russet, rhizoctonia, cuts, fair shape	some russet, rhizoctonia, sprouts at bud end

Pennsylvania Table 7. (Continued)

Seedling No. or Variety	Cambria County (central)	Lancaster County (southeast)	Schuylkill County (east)
BR7093-23	some rhizoctonia, smooth	some rhizoctonia, smooth	some skin discoloration, smooth
BR7093-42	cracks and dry rot, rough, skin discoloration	some rhizoctonia, rough, skin discoloration	rhizoctonia, skin discoloration
CA02-7	fairly attractive, some russet	some russet, fairly attractive	some russet, fairly attractive
CA46-11	shatter bruise, rhizoctonia, some russet, rough	fairly attractive, skin dis- coloration	fairly attractive, skin dis- coloration
F6102-5	some russet, reddish-color at bud end	some russet, reddish color at bud end	some russet, sprouted, skin discoloration, reddish-color at bud end
F6208	some russet, fair shape, skin discoloration	some russet, fair shape, skin discoloration	some russet, skin discoloration, fair shape
Atlantic	some rhizoctonia, few shatter bruise	rhizoctonia	attractive
Belleisle	rhizoctonia, some russet	rhizoctonia, sprouted, skin discoloration, some russet	some russet, sprouts, skin dis- coloration, fairly attractive
Green Mountain	some russet, rough	some russet, some rhizoctonia, rough	some russet, rough
Katahdin	some rhizoctonia, flat, cuts	some sprouting and some skin discoloration, fairly attractive	fair appearance, skin discoloration

Pennsylvania Table 7. (Continued)

Seedling No. or Variety	Cambria County (central)	Lancaster County (southeast)	Schuylkill County (east)
Kennebec	fair shape, few cuts	some cracks, some skin discoloration	fair shape, skin discoloration
Norchip	few rough, skin discoloration	skin discoloration, rough, few sprouts	rough, skin discoloration
Penn 71	some flat	some flat, rough	rough, flat
Snowchip	some russet, fair shape	some russet, attractive, few sprouts	some russet, cuts, skin discoloration, sprouts at bud end, fairly attractive

1/Tuber samples stored as follows: after harvest-barn conditions; after grading-near room conditions; tubers characterized after washing (composite of 4 reps.), November 17

TEXAS

J. Creighton Miller, Jr. and Douglas G. Smallwood

Variety Development and Testing

Seedling Program. Approximately 27,000 first year seedlings, representing 300 families, were grown for selection near Hereford in 1976. Half (12,776) of these resulted from crosses made in Texas, during the winter of 1974. The remainder were obtained in our exchange programs with Dr. Johansen in North Dakota (9,636) and Dr. Pavsek in Idaho (4,646). As in years past, half of the tubers of each clone selected from the exchange material were sent to North Dakota for virus indexing, observation, and seed increase. The other half will be grown and evaluated in Texas in 1977, as second year selections. Two, 1973 NDTX selections; 10, 1974 NDTX selections; and 20, 1975 NDTX and MinnTX selections will be advanced in 1977, based on their performance in Texas and the Red River Valley. Some 30,000 Texas seedlings were grown in the greenhouse this past fall, and, it is anticipated that, with our exchange programs in excess of 50,000 first year seedlings will be grown for selection in 1977.

Adaptation Trials. Some 466 entries were grown in replicated and nonreplicated trials at three locations in West Texas. Not all entries were included at each location. Only the results of replicated advanced selection and variety trials at Hereford are included herein. In the variety and advanced selection trial (Table 1), Red La Soda, ND9403-16R and Viking were the outstanding red entries, while ND 8891-3 was the outstanding white entry. The performance of the Norgold strains was superior to that of regular Norgold Russet, with Norgold 19 outstanding. Again, Centennial Russet performed poorly in our trials. The selection A69827-10, although not outstanding at Hereford, performed very well at the other locations.

The selections in the North Dakota advanced selection trial (Table 2) performed only reasonably well. Several Idaho selections, including NDA 9249-3, ALR 22-1, and C 6-5, showed promise (Table 3). Lines W 451-2, Minn 8521, WC 415-4, BC 8370-4, WC 415-14, and W 451-2 were the outstanding Minnesota, Colorado or Washington advanced selections (Table 4). Among the selections received from Nebraska (Table 5), Neb 498, A69.72-1, A133.70-1, Neb 185, WC 285-18, and Neb 42-1 merit further testing. Several of the NDTX selections (Tables 6&7) performed reasonably well, relative to the check varieties, and will be retested in 1977. Although not entered in replicated trials in 1976, the 1975 selections NDTX 147-1 Russ, NDTX 168-1W, MinnTX 8-1W, and MinnTX 48-2 Russ are very promising.

Texas Table 1. Total yield, percent of tubers over 4 ounces, average weight per tuber, specific gravity, vigor, and maturity for 22 potato varieties or selections grown near Hereford, Texas - 1976.

Variety or selection	Total yield cwt/A.	% of tubers over 4 oz.	Average weight/ tuber in oz.	Specific gravity	Vigor ^{1/}	Maturity ^{2/}
Red LaSoda	613	84.4	7.3	1.075	4.2	2.6
ND 8891-3	575	81.1	6.1	1.080	4.1	3.8
Norgold 19	537	88.5	7.0	1.073	4.4	2.9
Norgold M	527	85.9	6.5	1.079	4.3	3.3
Norgold H	494	88.7	6.4	1.077	4.1	3.6
Norgold 10	493	84.7	6.8	1.073	3.9	3.8
ND 9403-16 R	492	84.0	6.0	1.075	3.9	3.5
Viking	483	88.8	8.1	1.073	3.9	3.4
Norgold Russet	460	81.9	6.1	1.078	3.8	3.8
Minn 3866	452	83.2	5.1	1.086	4.3	3.1
Minn 4536	448	88.5	7.0	1.066	3.9	3.9
ND 8888-2	445	80.6	7.1	1.079	3.5	3.8
A 69827-10	445	86.5	6.9	1.084	3.7	3.4
WC 230-14	428	82.9	6.7	1.073	3.7	3.7
Early Gem	424	86.0	6.4	1.072	3.6	3.8
Minn 4858	410	89.5	5.7	1.078	3.8	2.9
Minn 6666	405	89.4	7.1	1.061	3.5	3.6
NDA 8694-3	372	83.7	5.9	1.082	3.8	3.3
WC 316-1	364	86.9	6.9	1.075	3.7	3.4
ND 8913-4 Russ	358	71.5	4.7	1.081	3.4	3.6
NDA 8856-11	335	85.9	6.5	1.084	2.9	4.0
Centennial	286	89.6	6.0	1.078	3.4	3.3
Average	448	85.1	6.5	1.076	3.8	3.5
L.S.D. (.05)	66	6.7	1.0			

^{1/} 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous.

^{2/} 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early.

Texas Table 2. Total yield, average number of tubers per plant, average weight per tuber, specific gravity, vigor, maturity, and general tuber rating for 17 North Dakota advanced selections and 3 check varieties grown near Hereford, Texas - 1976.

Selection or check variety	Total yield cwt/A.	Average number tubers/ plant	Average weight/ tuber in oz.	Specific gravity	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} tuber rating
Red LaSoda	829	7.5	10.6	1.069	3.8	3.3	2.5
Viking	669	5.3	11.2	1.069	3.1	3.5	3.3
Norgold Russet	568	8.8	6.0	1.073	3.3	4.5	2.4
ND 9498-4 R	556	5.7	9.0	1.069	3.5	3.5	2.0
ND 9450-8 Russ	495	7.3	6.4	1.077	2.9	3.6	2.0
I 39-1 Russ	481	9.0	4.9	1.086	3.3	3.8	2.0
ND 9516-4R	462	7.4	6.3	1.081	2.4	3.6	2.3
ND 9555-1 Russ	453	5.7	7.3	1.079	2.6	4.1	2.0
ND 9526-4 Russ	443	5.0	9.2	1.078	2.6	3.6	2.3
ND 9434-1 Russ	415	4.8	8.0	1.082	2.1	3.6	2.0
ND 9463-2 Russ	376	5.1	7.4	1.083	2.4	3.6	2.0
ND 9642-3 Russ	362	3.8	7.4	1.078	1.9	3.6	2.3
ND 9462-8 Russ	317	5.6	5.3	1.077	2.1	4.6	2.0
ND 8924-4 Russ	303	3.9	7.2	1.078	2.0	3.8	2.0
ND 9433-14 Russ	282	3.3	6.0	1.080	1.4	4.1	1.8
ND 9567-2 Russ	275	2.2	10.5	1.083	2.4	3.8	2.0
ND 9507-3 Russ	253	3.2	7.4	1.075	2.0	4.5	2.0
ND 9358-3 Russ	186	2.8	7.0	1.071	1.5	4.0	1.1
ND 9464-3 Russ	174	1.3	6.7	1.074	1.3	4.3	1.9
ND 9460-1 Russ	146	2.3	5.9	1.076	1.3	4.3	1.5
Average	602	5.0	7.5	1.077	2.4	3.9	2.1
L.S.D. (.05)	135		2.8				

^{1/}1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous.

^{2/}1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early.

^{3/}1 = poor to 5 = excellent.

Texas Table 3. Total yield, average number of tubers per plant, average weight per tuber, specific gravity, vigor, maturity, and general tuber rating for 18 Idaho or NDA advanced selections and 3 check varieties grown near Hereford, Texas - 1976.

Selection or check variety	Total yield cwt/A	Average numbers tubers/ plant	Average weight/ tuber in oz.	Specific gravity	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} tuber rating
Red LaSoda	870	11.5	7.0	1.068	4.3	1.9	3.0
Viking	702	6.2	9.8	1.071	3.6	3.5	3.5
ALR 22-1	659	9.4	7.2	1.078	3.3	3.1	2.3
A68678-1	622	7.1	8.2	1.086	4.3	2.1	2.8
A69424-1	594	11.5	4.8	1.090	5.0	1.1	2.0
NDA 9265-1	584	7.6	7.1	1.076	3.3	3.6	2.3
C6-5	577	6.0	10.1	1.077	3.1	3.1	2.8
Norgold Russet	565	8.6	6.1	1.071	3.0	3.9	2.6
A69337-6	563	8.9	5.6	1.087	3.8	3.0	2.5
ALR 4-2	507	7.5	5.9	1.078	4.0	1.9	2.3
NDA 9249-3	505	5.0	9.4	1.077	3.8	2.8	2.6
A6680-5	465	5.7	7.0	1.070	2.5	3.3	1.5
WN330-1	458	6.9	7.1	1.081	2.8	3.1	2.8
A71578-2	451	5.1	8.4	1.080	2.0	3.5	2.5
A68599-1	439	6.5	7.3	1.074	3.1	3.0	2.3
A70245-1	413	5.6	6.0	1.083	2.4	3.6	2.0
A71617-3	406	4.2	8.3	1.071	2.3	3.3	2.5
A66107-101	390	6.5	5.7	1.082	2.8	3.6	2.3
A70685-1	361	7.3	5.0	1.075	3.5	1.1	2.0
A70383-25	352	5.3	6.1	1.089	4.0	1.5	2.0
C26-11	209	4.0	3.8	1.067	3.4	1.0	1.5
Average	509	7.0	6.9	1.078	3.4	2.7	2.4
L.S.D. (0.5)	99		2.3				

^{1/} 1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous.

^{2/} 1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early.

^{3/} 1 = poor to 5 = excellent.

Texas Table 4. Total yield, average number of tubers per plant, average weight per tuber, specific gravity, vigor, maturity, and general tuber rating for 9 advanced selections received from Colorado and Minnesota and 3 check varieties of potatoes grown at Herford, Texas-1976.

Selection or check variety	Total Yield cwt/A.	Average number tubers/ plant	Average weight/ tuber in oz.	Specific gravity	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} tuber rating
Red LaSoda	894	9.9	8.3	1.070	3.9	3.3	3.0
Viking	749	6.6	10.6	1.074	3.9	2.5	3.3
Norgold Russet	591	9.0	6.1	1.079	3.3	4.1	2.5
BC8370-4	530	7.4	5.8	1.088	3.3	4.3	2.5
WC415-14	519	5.8	8.7	1.084	3.6	2.6	2.3
WC415-12	507	6.6	7.1	1.077	3.8	1.8	2.1
Minn 8521	495	5.7	8.0	1.067	3.0	3.3	2.0
Minn 7653	455	5.3	9.9	1.070	3.0	3.3	2.3
Minn 8586	455	7.3	5.7	1.085	3.1	3.3	2.3
WC435-3	392	7.8	4.7	1.081	3.8	1.5	1.5
WC415-1	378	6.0	5.9	1.088	3.5	2.8	2.0
WC373-6	300	4.2	6.5	1.079	2.5	3.5	2.0
Average	522	6.8	7.3	1.079	3.4	3.0	2.3
L.S.D. (.05)	132		1.6				

^{1/}1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous.

^{2/}1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early.

^{3/}1 = poor to 5 = excellent.

Texas Table 5. Total yield, average number of tubers per plant, average weight per tuber, specific gravity, vigor, maturity, and general tuber rating for 42 advanced selections received from Nebraska and 3 check varieties grown near Hereford, Texas-1976.

Selection or check variety	Total Yield cwt/A.	Average numbers tubers/ plant	Average weight/ tuber in oz.	Specific gravity	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} tuber rating
Red LaSoda	906	7.3	11.4	1.072	4.1	3.0	3.0
Neb 498	761	7.9	9.2	1.079	4.3	2.0	2.5
Neb 12-72-1	723	8.4	8.1	1.072	4.5	1.8	2.0
A 69.72-1	718	7.0	9.5	1.083	3.9	3.1	2.6
A-234-3	713	8.0	8.2	1.074	4.3	2.0	2.3
A-71.72-1	709	6.7	9.8	1.075	3.9	2.6	2.5
A-234-2	694	9.3	7.0	1.072	3.9	3.0	1.9
A 133.70-1	660	7.8	7.5	1.075	3.5	2.9	2.8
Neb 12-72-2	660	9.2	6.6	1.078	4.5	1.8	1.5
Neb 16-72-3	657	8.2	7.4	1.076	4.5	2.3	2.1
Neb 185	652	6.3	10.5	1.074	4.5	2.6	2.6
Viking	650	5.8	11.6	1.075	3.4	3.6	3.5
Neb 100-72-2	646	4.8	12.4	1.072	3.6	2.9	2.0
Neb 5-72-2	643	11.2	5.1	1.080	4.0	2.5	1.8
WC 285 18	631	6.8	8.5	1.092	3.6	3.6	2.5
A-210-2	626	8.2	7.0	1.085	4.0	2.8	1.8
Neb 103-72-1	605	9.0	6.9	1.059	3.8	1.3	1.3
Neb 133	605	6.7	8.3	1.073	3.6	3.3	2.0
A-234-1	599	8.5	6.6	1.068	3.9	2.9	1.9
Norgold Russet	592	7.9	7.0	1.074	3.3	4.4	2.0
Neb 15-72-3	580	8.2	7.2	1.072	3.9	1.5	2.5
Neb 42-1	573	8.5	7.7	1.076	3.9	2.9	2.8
A-111-2	572	7.2	6.6	1.085	4.0	2.5	1.4
Neb 16-72-4	537	5.8	8.5	1.074	3.9	1.3	1.8
A 63.71-1	535	4.9	8.3	1.073	3.1	3.4	2.0
A 147.71-1	523	6.1	8.8	1.067	3.1	1.9	1.8
A 147.71-2	523	6.9	7.7	1.075	3.6	3.0	2.3
Neb 100-72-1	521	5.8	8.4	1.070	3.5	3.0	1.8
A 102.71-2	502	6.5	7.1	1.072	4.0	2.8	2.3
Neb 12-72-3	490	9.7	5.2	1.067	4.4	1.8	1.3
Neb 104-72-1	488	8.7	5.8	1.079	3.9	2.8	1.5
Neb 182	474	5.1	8.6	1.070	3.5	3.3	1.4
A-111-3	450	4.6	9.3	1.074	3.4	3.4	2.0
W 285-146	449	5.9	7.9	1.064	1.3	1.9	1.3
Neb 103-72-2	442	5.6	7.3	1.074	4.4	1.8	1.3

Continued

Texas Table 5. Continued

Selection or check variety	Total yield cwt/A.	Average number tubers/ plant	Average weight/ tuber in oz.	Specific gravity	Vigor ^{1/}	Maturity ^{2/}	General ^{3/} tuber rating
Neb 134	429	4.7	8.4	1.072	3.6	3.8	1.4
Neb 3-72-1	401	4.8	7.8	1.066	3.4	2.4	1.5
Neb 103-72-3	349	4.3	8.2	1.068	4.3	0.9	1.5
WC 316-1	336	2.9	10.6	1.067	3.3	3.4	2.5
Neb 12-72-4	319	2.2	10.5	1.066	3.6	2.4	1.3
WC 285-83	303	3.1	9.1	1.085	3.5	2.9	2.1
A-17.72-2	293	5.0	5.9	1.071	2.5	2.6	1.1
WC 314-2	291	3.0	9.0	1.089	2.8	3.0	2.0
Belt. Russet 16	272	2.9	9.8	1.087	1.5	3.8	2.1
WC 230-14	218	4.1	4.9	1.070	2.5	3.0	1.5
Average	540	6.5	8.2	1.023	3.6	2.7	2.0
L.S.D. (.05)	112		2.2				

^{1/}1 = poor or weak, 2 = fair, 3 = medium, 4 = vigorous, 5 = very vigorous.

^{2/}1 = very late, 2 = late, 3 = medium, 4 = early, 5 = very early.

^{3/}1 = poor to 5 = excellent.

Texas Table 6. Parentage, total yield, average number of tubers per plant, average weight per tuber, specific gravity, tuber type and general tuber rating of 14, 1973 North Dakota - Texas advanced selections and 3 check varieties grown near Hereford, Texas - 1976.

Selection or check variety	Parentage	Total yield cwt/A	Average		Specific gravity	Tuber type	General ^{1/} tuber rating
			number tubers/ plant	weight tuber in oz.			
Red LaSoda		625	6.6	8.8	1.072	Oblong	3.0
Viking		555	5.8	9.4	1.072	Oblong	2.8
NDTX 9459-3 Russ	B 7196-40 x ND 8827-1 Russ	525	8.3	6.2	1.085	Oblong	2.7
NDTX 9449-8 Russ	B 7196-4 x ND 8724-3 Russ	466	7.1	6.6	1.070	Oblong	2.4
Norgold Russet		466	6.3	6.9	1.078	Oblong	3.3
NDTX 9433-1 w	Wash 245-2 x ND 8724-3 Russ	461	5.9	7.5	1.076	Oblong	2.4
NDTX 9550-2 Russ	ND 8464-1 Russ x Wash 245-2	449	7.1	5.9	1.081	Long	2.3
NDTX 9446-5 Russ	B 7188-2 x ND 8134-2 Russ	436	7.3	5.6	1.085	Oblong	2.6
NDTX 9580-5 R	ND 8691-15 R x ND 8843-12 R	434	7.1	8.6	1.081	Long	2.9
NDTX 9550-1 Russ	ND 8464-1 Russ x Wash 245-2	430	8.7	4.9	1.079	Oblong	2.7
NDTX 9523-1 R	ND 8105-1 R x ND 8845-12 R	419	7.2	6.7	1.072	Oblong	2.8
NDTX 9449-3 w	B 7196-4 x ND 8724-3 Russ	419	5.1	7.6	1.071	Oblong	2.9
NDTX 9446-2 Russ	B 7188-2 x ND 8134-2 Russ	392	7.8	4.8	1.070	Oblong	2.4
NDTX 9530-3 Russ	ND 8177-9 Russ x B 7157-9	392	5.9	6.8	1.070	Oblong	2.6
NDTX 9580-6 R	ND 8691-15 R x ND 8843-12 R	372	7.0	5.8	1.065	Oblong	2.6
NDTX 9518-1 Russ	ND 7755-3 Russ x A 59197-5	369	8.8	4.5	1.076	Oblong	2.3
NDTX 9545-2 Russ		303	4.8	5.8	1.081	Oblong	2.2
Average		442	6.9	6.6	1.076		2.6
L.S.D. (.05)		57		1.5			

1 = very poor to 5 = excellent.

Texas Table 7. Continued

Selection or check variety	Parentage		Total yield cwt/A	Specific gravity	Tuber type	Skin type	General ^{1/} tuber rating
NDTX 9717-1	B7583-16	X Wash. 245-2	415	1.087	Oblong	White	1.5
NDTX 9721-2	B7608-2	X Wash. 245-2	415	1.086	Oblong	White	1.5
NDTX 9800-4R	ND 8200-4R	X ND 8894-4R	408	1.078	Oblong	Red	2.0
NDTX 9817-1R	ND 8767-10R	X ND 8200-4R	408	1.071	Oblong	Red	2.0
NDTX 9727-1	B 7637-3	X Wash. 245-2	404	1.066	Oblong	White	2.0
NDTX 9851-2 Russ	ND 8914-2 Russ	X Wash. 245-2	404	1.075	Long	Russet	1.5
NDTX 9806-2 Russ	ND 8607-11 Russ	X Wash. 245-2	397	1.084	Oblong	Russet	1.5
NDTX 9518-1 Russ	ND 7755-3 Russ	X A59197-5	366	1.076	Oblong	Russet	2.3
NDTX 9875-2 Russ	ND 9004-1 Russ	X Wash. 245-2	362	1.070	Oblong	Russet	2.3
NDTX 9701-1 Russ	B7147-15	X Nooksack	359	1.093	Oblong	Russet	2.0
NDTX 9795-6 Russ	ND 7642-2 Russ	X Wash. 245-2	345	1.072	Oblong	Russet	2.0
NDTX 9808-1R	ND 8735-7R	X ND 8200-4R	342	1.065	Oblong	Red	2.0
NDTX 9713-1 Russ	B7196-40	X ND 9013-1 Russ	331	1.071	Oblong	Russet	1.5
NDTX 9863-3 Russ	ND 8947-2 Russ	X Wash. 245-2	296	1.067	Oblong	Russet	1.8
NDTX 9446-3 Russ	B7188-2	X ND 8134-2 Russ	293	1.064	Oblong	Russet	2.3
NDTX 9806-3 Russ	ND 8706-11 Russ	X Wash. 245-2	293	1.094	Oblong	Russet	1.5
NDTX 9730-4 Russ	B7637-21	X ND 8706-11 Russ	251	1.079	Oblong	Russet	2.0
NDTX 9856-1 Russ	ND 8922-1 Russ	X Wash. 245-2	247	1.067	Oblong	Russet	2.0
NDTX 9741-3	B7661-2	X ND 7003-2 Russ	223	1.075	Oblong	White	1.4
NDTX 9731-1 Russ	B7637-21	X ND 8922-1 Russ	216	1.070	Oblong	Russet	2.3
NDTX 9780-3	Wischip	X Norchip	171	1.071	Round	White	1.0
NDTX 9863-4 Russ	ND 8947-2 Russ	X Wash. 245-2	126	1.072	Oblong	Russet	1.8
NDTX 9744-1 Russ	B7813-5	X ND 8922-1 Russ	75	1.068	Oblong	Russet	1.5
NDTX 9856-3 Russ	ND 8922-1 Russ	X Wash. 245-2	56	1.079	Oblong	Russet	1.0
Average			423	1.075			1.9
L.S.D. (.05)			124				

^{1/}1 = very poor to 5 = excellent.

Texas Table 7. Parentage, total yield, specific gravity, tuber type, skin type and general tuber rating of 46, 1974 North Dakota-Texas selections and 3 check varieties grown near Hereford, Texas-1976.

Selection or check variety	Parentage	Total yield cwt/A.	Specific gravity	Tuber type	Skin type	General ¹ / tuber rating
Red LaSoda		878	1.075	Oblong	Red	3.0
Viking		676	1.078	Oblong	Red	3.4
Norgold Russet		656	1.073	Oblong	Russet	2.9
NDTX 9780-5	Wischip	638	1.076	Oblong	White	1.8
NDTX 9800-1R	ND 8200-4R	624	1.074	Oblong	Red	1.9
NDTX 9800-2R	ND 8200-4R	610	1.078	Oblong	Red	2.0
NDTX 9705-1	BR 7072-5	603	1.082	Oblong	White	1.8
NDTX 9863-5 Russ	ND 8947-2 Russ	585	1.071	Oblong	Russet	2.3
NDTX 9876-2	ND 9004-1 Russ	582	1.075	Oblong	White	2.3
NDTX 9778-4	Wisc. 623	579	1.079	Oblong	White	2.0
NDTX 9523-1R	ND 8105-1R	572	1.063	Oblong	Red	2.4
NDTX 9778-2	Wisc. 623	568	1.071	Oblong	White	2.0
NDTX 9770-4	Minn 81491	552	1.070	Oblong	White	2.5
NDTX 9798-2R	ND 8168-6R	540	1.067	Oblong	Red	2.0
NDTX 9778-1	Wisc. 623	477	1.070	Oblong	White	1.5
NDTX 9798-1R	ND 8168-6R	460	1.072	Oblong	Red	2.0
NDTX 9784-4 Russ	Wash. 245-2	457	1.074	Oblong	Russet	2.3
NDTX 9721-3	B 7608-2	453	1.086	Oblong	White	2.0
NDTX 9767-2R	Minn. 3866	450	1.067	Oblong	Red	1.3
NDTX 9702-1 Russ	B 7147-15	446	1.073	Oblong	Russet	2.0
NDTX 9822-1R	ND 8105-1R	432	1.068	Oblong	Red	1.8
NDTX 9798-3R	ND 8168-6R	429	1.075	Oblong	Red	2.0
NDTX 9851-1 Russ	ND 8914-2 Russ	425	1.087	Oblong	Russet	2.0
NDTX 9715-1 Russ	B 7197-101	422	1.072	Oblong	Russet	2.3
NDTX 9767-1R	Minn 3866	416	1.074	Oblong	Red	2.0

Continued

VERMONT

By S. C. Wiggans, W. R. Kelly, R. N. Jensen, H. J. Murphy

During 1976, three potato variety trials were conducted in Vermont by the Plant Pest Control Division of the Vermont Department of Agriculture, the Plant and Soil Science Department of the University of Vermont, and the Plant and Soil Science Department of the University of Maine. These trials were located at Brandon, Elmore, and South Burlington, Vermont. There were five replicates in a randomized block design at each location. Seedpieces of all varieties were planted by hand. Varieties were planted 9 inches apart, except Bliss Triumph, B7147-8, and Nooksack, which were planted 13 inches apart; Raritan, 10 inches apart; and Russet Burbank and Nampa, 16 inches apart. These plantings were part of the Cooperative Northeast Region Potato Variety Trials conducted in cooperation with the National Potato Breeding Program.

The plots at Brandon were planted May 26, killed September 18, and harvested October 12, 1976 (Table 1). Fertilizer was applied at the rate of 144-288-288 per acre. Potatoes were grown in a sandy loam soil. Weed control was good. The season was cool and wet.

The plots at Elmore were planted June 4, killed September 15, and harvested October 5, 1976 (Table 2). Fertilizer was applied at a rate of 144-216-216 per acre. Potatoes were grown in a medium loamy soil. The season was cool and wet.

The plots at South Burlington were planted June 1, killed by frost, and harvested October 13, 1976 (Table 3). Fertilizer was broadcast at 60-60-60 per acre, and topdressed at 40-40-40 per acre. Potatoes were planted in light sandy soil. Weed control was good. The season was cool and wet during June and July.

Chip color indices for potato varieties in all three locations in 1976 are given in Table 4.

The five highest varieties at Brandon were Katahdin, CA40-7, Bliss Triumph, CA02-7, and BR7108-1. The five highest varieties at Elmore, in northern Vermont, were Atlantic, Belleisle, CA40-7, Bliss Triumph, and CA02-7. The five highest varieties at South Burlington were F6208, Atlantic, Hudson, Cascade, and Belleisle. Belleisle was a consistently high yielding variety at all three locations. It appears to be of interest to Vermont potato growers. Atlantic was high yielding at both Elmore and South Burlington. It has a good appearance and good cooking qualities, as evidenced by its popularity in Vermont kitchens.

Vermont Table 1. Yield, percentage of yield between 1-7/8 and 4 inches, specific gravity, and total solids for 20 potato varieties grown at Brandon, Vermont - 1976.

Variety ¹	Yield above 1-1/2 inches Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/4 to 4 inches	Specific Gravity	Percentage total solids
Atlantic	385	96.0	90.0	1.083	20.85
Belleisle	373	95.6	84.4	1.071	18.32
Bliss Triumph	421	85.6	32.3	1.062	16.42
Cobbler	358	98.0	86.7	1.066	17.26
Katahdin	450	99.2	93.0	1.073	18.74
Kennebec	331	97.5	85.2	1.068	17.68
Nampa	271	56.5% 4 to 10 oz. size		1.082	20.64
Nooksack	178	74.7% 4 to 10 oz. size		1.083	20.85
AF41-2	383	98.3	85.3	1.069	17.89
B6503-2	311	98.3	85.7	1.078	19.79
B6986-26	362	91.4	84.0	1.077	19.58
B7147-8	267	58.8% 4 to 10 oz. size		1.069	17.89
BR6863-3	310	98.7	93.5	1.079	20.00
BR6863-5E	344	97.2	83.5	1.075	19.16
BR7089-6	322	97.0	88.8	1.082	20.64
BR7104-10	370	98.1	89.2	1.074	18.95
BR7108-1	394	98.2	85.4	1.076	19.37
CA02-7	409	97.8	87.5	1.076	19.37
CA40-7	426	99.1	84.8	1.071	18.32
CC26-1A	380	99.5	86.7	1.080	20.21
Bayes L.S.D. (0.05)	76			0.005	

^{1/} Planted - May 26; killed - September 18; harvested - October 12, 1976.

Seedpiece spacing: Nooksack and B7147-8 spaced 12 inches apart; Nampa spaced 16 inches apart; all other varieties spaced 8 inches apart.

Fertilization: 144-288-288.

Vermont Table 2. Yield, percentage of yield between 1-7/8 and 4 inches, specific gravity, and total solids for 20 potato varieties grown at Elmore, Vermont - 1976.

Variety ¹	Yield above 1-1/2 inches Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/4 to 4 inches	Specific Gravity	Percentage total solids
Atlantic	353	97.0	83.6	1.085	21.27
Belleisle	341	97.0	80.5	1.079	20.00
Bliss Triumph	332	74.4	19.9	1.061	16.21
Cobbler	313	95.8	77.7	1.068	17.68
Katahdin	325	98.1	83.6	1.069	17.89
Kennebec	336	94.9	83.2	1.070	18.10
Nampa	227	55.4% 4 to 10 oz. size		1.080	20.21
Nooksack	200	67.6% 4 to 10 oz. size		1.085	21.27
AF41-2	321	97.3	75.6	1.070	18.10
B6503-2	218	97.3	82.2	1.079	20.00
B6986-26	302	98.3	86.6	1.076	19.37
B7147-8	198	68.7% 4 to 10 oz. size		1.080	20.21
BR6863-3	285	96.7	85.6	1.078	19.79
BR6863-5E	255	96.2	76.6	1.074	18.95
BR7089-6	260	98.2	82.4	1.082	20.64
BR7104-10	298	95.5	78.5	1.069	17.89
BR7108-1	284	96.5	78.9	1.074	18.95
CA02-7	327	95.5	76.4	1.077	19.58
CA40-7	337	97.9	83.1	1.072	18.53
CC26-1A	302	96.4	73.2	1.073	18.74
Bayes L.S.D. (0.05)	57			0.003	

^{1/}Planted - June 4; killed - September 15; harvested - October 5, 1976.

Seedpiece spacing: Nooksack and B7147-8 spaced 12 inches apart; Nampa spaced 16 inches apart; all other varieties spaced 9 inches apart.

Fertilization: 144-216-216.

Vermont Table 3. Yield, percentage of yield between 1-7/8 and 4 inches, specific gravity and total solids for 28 potato varieties grown at Burlington, Vermont - 1976.

Variety ¹	Yield above 1-1/2 inches Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/2 to 4 inches	Specific Gravity	Percentage total solids
Abnaki	318	98.1	84.1	1.080	20.21
Atlantic	398	98.0	81.1	1.095	23.38
Bake King	327	97.0	65.9	1.097	23.80
Belleisle	361	99.1	85.2	1.088	21.90
Bliss Triumph	295	64.8%	4 to 10 oz. size	1.072	18.53
Cascade	367	96.6	64.9	1.075	19.16
Chieftain	285	96.0	67.5	1.074	18.95
Cobbler	250	95.2	63.6	1.079	20.00
Green Mountain	356	96.1	64.5	1.098	24.01
Hudson	391	99.0	90.6	1.083	20.85
Katahdin	253	96.5	61.8	1.081	20.43
Kennebec	332	98.2	77.7	1.085	21.27
Nampa	254	73.8%	4 to 10 oz. size	1.094	23.17
Norland	232	93.8	45.3	1.067	17.47
Raritan	307	59.8%	4 to 10 oz. size	1.099	24.22
Russet Burbank	272	60.9%	4 to 10 oz. size	1.091	22.54
Superior	285	97.6	79.9	1.082	20.64
AF41-2	319	96.6	69.9	1.075	19.16
B6503-2	198	93.4	47.7	1.085	21.27
B6986-26	268	97.8	79.7	1.091	22.54
B6987-2	253	97.5	73.8	1.078	19.79
B7147-8	269	56.6%	4 to 10 oz. size	1.087	21.69
BR6863-5	320	96.6	65.1	1.084	21.06
BR7089-6	229	94.9	56.1	1.087	21.69
BR7104-10	275	94.3	58.4	1.084	21.06
CA40-7	277	97.0	66.1	1.077	19.58
CC26-1A	240	76.5	46.9	1.090	22.33
F6208	437	98.5	88.8	1.086	21.48
Bayes L.S.D. (0.05)	113			0.005	

¹/Planted - June 1; harvested - October 13, 1976.

Seedpiece spacing: Bliss Triumph spaced 12 inches apart; Raritan spaced 10 inches apart; and Russett Burbank spaced 16 inches apart. All other varieties spaced 9 inches apart.

Fertilization: 60-60-60 broadcast preplant plus 40-40-40 topdressed.

Vermont Table 4. Chip color indices for potato varieties grown at Burlington, Brandon, and Elmore, Vermont - 1976.

Variety	Location and Chip Color ¹		
	Burlington	Brandon	Elmore
Abnaki	7.0	8.1	9.1
Atlantic	7.5		
Bake King	6.5		
Belleisle	7.2	9.0	9.6
Bliss Triumph	10.0	10.0	10.0
Cascade	7.8		
Chieftain	8.5		
Cobbler	6.8	8.7	9.6
Green Mountain	10.0		
Hudson	8.2		
Katahdin	7.8	9.2	9.9
Kennebec	6.8	8.9	9.4
Nampa	10.0	10.0	10.0
Nooksack		9.2	9.9
Norland	10.0		
Raritan	10.0		
Russet Burbank	8.9		
Superior	6.5		
AF41-2	9.0	9.1	9.5
B6503-2	7.5	7.5	8.4
B6986-26	6.8	7.4	8.5
B6987-2	7.0		
B7147-8	7.0	8.5	9.9
BR6863-3		7.4	9.0
BR6863-5	5.8	6.7	8.3
BR7089-6	6.2	7.9	7.0
BR7093-23		9.5	9.8
BR7104-10	10.0		
BR7108-1		8.8	8.3
CA02-7		9.5	8.5
CA40-7	10.0	9.9	9.6
CC26-1A	7.8	8.7	8.3
F6208	5.9		
Bayes L.S.D. (0.05)	0.8	0.4	0.8

^{1/} Chips with lower indices are lighter in color.

VIRGINIA

Boyett Graves

Potato Variety Development Studies

Methods. Potato varieties and seedlings were evaluated for adaptability, horticultural characters, and chipping suitability in either Advanced (5 replications), Intermediate (3 replications), or First Year Observational (single plot) Trials. Standard check varieties included Pungo, Superior, Norchip, LaChipper, Wauseon and Norgold Russet. Seedlings were obtained from the USDA, ARS Potato Breeding Program, Beltsville, Maryland, the Pennsylvania Agricultural Experiment Station and the Campbell Soup Co. breeding programs. Cultural practices were according to recommendations for commercial production in the area including 12 inch spacing, 36 inch rows, 100 lbs. N, P, and K band placed, systemic insecticide, and Lorox for weed control. Plots were irrigated 4 times April-May but were not watered in June because of labor or mechanical difficulties. Plots were planted March 2 and harvested July 5.

Weather Conditions. Dry, warm weather 2 weeks prior to planting; soil temperature 57° F at planting; 1.48 inches rain 6 days after planting. General growing conditions were very, very dry with the area receiving less than half the average rainfall for the first 6 months of 1976.

Advanced Yield Trial. Seedlings B8073-3, B7009-4, B7516-7, B7516-9, B7252-3, B6987-29, and B8392-5 were among the top yielding selections along with the varieties Atlantic, Pungo, LaChipper, and Wauseon. All had acceptable to excellent ratings for air pollution injury, conformation, and chip color (except B7009-4). The varieties Norchip and Superior both produced lower yields than expected. Atlantic (B6987-56) showed no symptoms of heat necrosis as it did in 1975. Dry matter for this variety was very high for potatoes grown on the Eastern Shore of Virginia.

In the Intermediate Trial (Virginia Table 2), seedlings B8091-8, B8477-4, B8599-42, and Campbell Soup Co.'s BR6626-5 were selected for future testing.

Air Pollution injury was minimal in these plots in 1976 although an ozone monitor recorded ozone levels above the assumed injury threshold several times during the growing season. This fact further strengthens our belief that symptom expression is a function of pollution concentration and the particular physiological state of the plant at the time high concentrations occur.

Insect Studies. In 1975 potato seedlings and varieties were planted in July for European corn borer resistance evaluations. A very light infestation of corn borer and a very high infestation of potato tuber moth developed. Virginia Table 4 shows field and storage counts of tuber moth injury. There was no correlation between mines/stem and mines/tuber indicating that tuber injury in storage cannot be used to estimate plant damage in the field. One interesting aspect of the work was that russet skinned selections had higher infestations in the field and lower tuber infestations (Virginia Table 5). It should be kept in mind that these data were collected from limited seedling populations but it does suggest an area for more work.

Virginia Table 1. Advanced Yield Trial. Yield, maturity, air pollution ratings, specific gravity and chip color ratings of varieties and seedlings grown at Painter, Virginia, 1976

Pedigree	Yield/ Size A cwt/A	Air Pollution Rating ^{2/}	Maturity	Tuber Conform- ation ^{3/}	Specific Gravity	Chip Color ^{4/}		
						At Harvest	1 Wk. After Harvest	Mean 5 Wkly. Chippings
B7009-4	290 a	9	Late	3	1.087	7	5	5.2
Pungo	284 ab	8	Medium	3	1.083	2	4	3.2
B7516-9	283 ab	8	M. Late	4	1.089	2	3	2.2
LaChipper	274 abc	8	M. Early	2	1.083	4	2	3.0
Wauseon	269 abcd	6	Medium	3	1.083	1	3	2.2
Bf987-29	269 abcd	8	Late	3	1.084	2	2	2.2
B7252-3	262 abcde	9	Late	2	1.087	1	3	2.5
Katahdin	260 abcde	6	V. Late	1	1.083	2	4	3.3
Atlantic	259 abcdef	8	Late	3	1.098	3	2	2.2
Alamo	259 abcdef	7	Early	3	-	-	-	-
Abnaki	259 abcdef	8	V. Late	3	1.082	3	5	3.3
B8073-3	256 abcdef	8	M. Early	3	1.085	2	3	2.7
B8392-5	252 abcdefg	8	Early	4	1.096	3	3	2.3
B7516-7	250 abcdefg	8	Late	3	1.088	1	3	1.8
B6969-2	242 abcdefg	8	M. Late	4	1.081	3	4	3.7
BR6862-2	240 bcdefg	8	Medium	3	1.084	2	3	2.3
B7902-4	236 bcdefgh	9	M. Late	3	-	-	-	-
B7154-10	233 cdefghij	7	Medium	2	1.085	5	3	2.0
Nor. Russet	228 cdefghij	8	Medium	2	-	-	-	-
B7859-2	221 defghijk	6	Late	3	1.095	2	2	1.8
B7160-4	218 efghikj	7	M. Late	3	1.085	5	3	3.7
Norchip	216 efghijk	7	M. Late	2	1.089	2	3	2.8
Iludson	209 fghijk	9	V. Late	2	-	-	-	-
B6951-5	203 ghijk	9	Medium	2	1.086	5	3	2.3
B7608-2	203 ghijk	8	Medium	3	1.081	1	1	1.5
B7902-9	190 hijkl	8	M. Late	2	-	-	-	-
B7802-2	186 ijkl	7	M. Early	2	-	-	-	-
BR6863-3	184 jkl	6	M. Late	4	-	-	-	-
Wischip	183 jkl	6	M. Late	3	1.085	1	3	2.0
Superior	178 kl	9	M. Early	3	1.087	2	3	2.5
B7583-6	155 l	7	M. Late	3	-	-	-	-
B7147-8	146 l	6	M. Late	3	1.096	3	3	3.2

1/, 2/, 3/, 4/ See Virginia Table 2

Virginia Table 2. Intermediate Trial. Yield, maturity, air pollution injury ratings, specific gravity and chip color rating of potato seedlings and varieties grown at Painter, Virginia, 1976

Pedigree	Yield/ Size A cwt/A	Air Pollution Rating	Maturity	Tuber Conform- ation ^{3/}	Specific Gravity	At Harvest	Chip Color ^{4/}	
							1 Wk. After Harvest	Mean 5 Wkly. Chippings
Pungo	312 a	8	M. Early	2	1.083	2	4	3.2
B7930-2	292 ab	7	M. Early	3	-	-	-	-
B8091-8	286 abc	8	M. Early	3	1.083	4	2	3.3
B8477-4	280 abcd	6	Medium	3	1.090	1	2	1.8
B8101-3	274 abcd	9	M. Early	3	-	-	-	-
Wauseon	271 abcde	6	Late	3	1.083	1	3	2.2
B8599-42	269 abcde	6	M. Late	4	1.082	3	3	2.6
B7828-13	263 abcdef	9	Medium	2	-	-	-	-
B8514-18	261 abcdef	6	M. Early	2	-	-	-	-
Nor. Russet	259 abcdef	6	M. Early	3	-	-	-	-
B6955-14	251 abcdef	6	Medium	2	-	-	-	-
BR626-5	251 abcdefg	9	Late	2	1.081	3	5	5.2
Norchip	237 bcdefg	6	M. Early	3	1.089	2	3	2.8
8YY-3	231 cdefgh	6	V. Late	2	1.075	2	2	2.5
8DW-8	224 defgh	6	Late	2	1.082	3	2	2.5
80D-2	222 defgh	7	V. Late	2	1.075	2	3	2.5
8YY-1	213 efgh	9	V. Late	3	1.082	2	3	3.2
FL162	206 fgh	6	V. Late	2	1.075	2	3	2.8
8TW-2	195 gh	7	V. Late	3	1.100	2	1	2.3
6CX-6	174 h	9	V. Late	3	-	-	-	-

1/ Yields followed by a letter in common are not significantly different at 1% level of probability.

2/ Air Pollution Injury Ratings: 0 = dead; 1,2,3,4 = increasing appearance of plants with decreasing leaf fall; 5 = most leaves with symptoms but general appearance good; 6,7,8 = decreasing percent of foliage symptoms; 9 = no symptoms.

3/ Tuber conformation: 0 = very poor appearance; 4 = excellent appearance.

4/ Chip Color. Ratings by Wise Foods, Berwick, Pennsylvania. 1 = very light color; 2,3,4 = acceptable color; 5 = light brown; 6-12 brown to black.

Virginia Table 3. First Year Observational Trial. Yield, air pollution injury, maturity, specific gravity and chip color of potato seedlings and varieties. Painter, Virginia, 1976

Pedigree	Yield Size A cwt/A	Air Pollution Injury ^{1/}	Maturity	Tuber Conform- ation ^{2/}	Specific Gravity	Chip Color ^{3/}		
						At Harvest	1 Wk. After Harvest	Mean 5 Wkly. Chippings
B8575-5	274	8	V. Late	3	1.080	3	1	3.2
LaChipper	263	8	M. Early	2	1.083	4	2	3.0
Nor. Russet	234	8	M. Late	1	-	-	-	-
Norchip	233	7	Medium	2	1.089	2	3	2.8
B8004-8	213	-	-	4	1.073	4	4	4.0
B8302-5	209	7	Medium	4	1.072	3	4	4.3
B8443-5	209	6	M. Late	4	1.074	1	3	2.0
B8501-10	197	9	M. Early	3	1.089	3	3	2.5
B7888-8	197	-	-	4	1.075	3	2	3.2
B8462-1	193	8	Medium	3	1.079	1	2	1.3
B8395-3	191	8	M. Late	4	1.080	3	3	3.5
B7910A-7	168	-	-	3	1.073	5	4	3.3
B8123-12	161	6	-	3	1.079	2	5	2.5
B8497-36	157	7	V. Late	3	1.081	2	3	3.2
B8498-9	157	9	M. Early	4	1.083	1	1	1.5
B8392-6	147	7	M. Late	3	1.084	1	5	5.3
B8348-1	147	-	-	3	1.074	3	4	3.5
B8336-1	143	6	V. Late	3	1.079	3	5	4.3
B8375-7	139	6	M. Early	4	1.076	4	4	3.3
B8545-18	131	7	Medium	4	1.081	2	2	3.2
B8308-5	130	6	M. Late	3	1.086	2	3	3.2
B8527-4	99	5	M. Early	4	1.078	2	6	3.5
B8366-4	83	6	M. Late	3	1.085	4	5	4.7

^{1/} Air Pollution Injury Ratings: 0 = dead; 1,2,3,4 = increasing appearance of plants with decreasing leaf fall; 5 = most leaves with symptoms but general appearance good; 6,7,8 = decreasing percent of foliage symptoms; 9 = no symptoms.

^{2/} Tuber conformation: 0 = very poor appearance; 4 = excellent appearance.

^{3/} Chip Color: Ratings by Wise Foods, Berwick, Pennsylvania. 1 = very light color; 2,3,4 = acceptable color; 5 = light brown; 6-12 = brown to black.

Virginia Table 4. Mean number of tuberworm mines in leaves and stored tubers of potato seedlings and varieties. 1975-76.

Pedigree	Leaf Mines per Stem		Pedigree	Leaf Mines per Stem	
	(Field Counts)	Mines/Tuber (Storage Counts)		(Field Counts)	Mines/Tuber (Storage Counts)
B7861-2	18		B7139-4	26	7.9
B6987-57	72	3.2	Hudson	46	4.3
B7165-2	80	11.5	B7134-3	54	6.1
B6987-43	94	9.4	B7680-3	56	10.9
B7141-1	96	9.1	B7151-4	62	7.4
B7575-1	96		Sebago	66	10.0
B7845-29	96	2.9	B7165-8	74	12.7
B7813-5	100	12.0	Abnaki	80	12.2
B7148-1	104	7.3	B7138-11	80	12.3
B7848-23	104	10.0	B7152-1	82	5.9
B6951-5	104	6.0	B7152-3	92	10.1
B7848-2	106	7.5	B7160-4	98	4.2
B6987-29	108	10.5	B7147-90	98	10.8
B7711-11	114	5.8	B6495-20	100	
B7583-6	116	4.4	Norchip	110	10.4
B7510-1	116	15.5	B7152-14	110	5.5
B7188-56	122	4.2	B6987-56	110	7.4
B6532-4	122	8.6	B7153-29	120	9.8
B6987-2	124	6.4	B7636-4	125	10.1
B7684-7	124	4.0	Wauseon	130	14.3
B7196-25	126	3.5	B7669-2	132	9.3
B6987-54	134	10.3	Superior	135	12.6
B7147-10	144	3.3	Cobbler	142	9.3
B6567-12	150	10.0	B7694-1	144	16.0
B7190-2	156	6.5	B7587-5	148	5.7
B6503-2	216	9.9	B7167-30	160	9.2
B7196-23	238	7.6	B7154-10	178	6.3
B6951-1	300		B7147-8	178	2.8
B7167-2	300		B7679-9	186	4.4
B7676-2	300		B7147-9	212	5.4
			B7147-19	300	15.6
			B6969-2	300	8.0

Virginia Table 5. Tuberworm Injury to White and Russet Skinned Potatoes,
Painter, VA, 1975

	Mean No. Leaf Mines per Stem (Field Counts)	Mean No. Mines/Tuber (Storage)
White Skins	55.2	9.2
Russet Skins	88.6	6.4
Difference	33.4*	2.8*

*Significant at 5% level of probability.

WASHINGTON

N.M. Holstad, R. Kunkel, R.C. Holland and W.M. Iritani

Potato Variety Trials

Six trials were conducted. Five were at the Royal Slope Research Farm and one was at the Othello Research Farm.

The land at the Royal Slope Farm was spring plowed, disked and packed; whereas, the land at Othello was not spring tilled.

In the Royal Slope trials 1, 2, and 3, the plots were single rows 28 feet long. Every fourth row was planted to Russet Burbank. The two clones on each side of the row of Russet Burbank potatoes were compared with the Russet Burbank on a paired plot basis. Each clone was randomly duplicated. The seed was spaced 8.2 inches apart.

Specific gravity was determined with a Potato Chip Institute potato hydrometer.

Chip color was evaluated by taking longitudinal center slices from five tubers and deep fat frying them at 375 F until bubbling ceased. The color was rated using the American Potato Chip Institute color chart. Values of seven or less were considered acceptable. Uniformity of chip color was rated on a scale of one to four, one being the most uniform.

On June 29 the clones were sprayed with Sencor at .25 lbs ai/acre. Some of the clones were extremely susceptible to Sencor damage. The relative damage is given in table 1.

Royal Slope Trial I (Table 2). Seed tubers of 39 clones and 4 named varieties were cut into two ounce seed pieces and treated with Captan on April 12-13 and were planted on April 14-15. The plants were side dressed with 2,500 lbs/acre of a 12-12-12 suspension fertilizer. On June 3 the plants were about 5-6 inches tall. The vines were beaten off on September 21, and the tubers were harvested on September 30. The tubers were stored at 40 F until February 16 when specific gravity and hollow heart determinations were made. Forty tubers per clone were cut for brown center and hollow heart.

Royal Slope Trial II (Table 3). Seed tubers of 39 clones and 5 named varieties were cut into two ounce seed pieces and treated with Captan on April 12-13. They were planted on April 19. The plants were side dressed with 2,708 lbs/acre of a 12-12-12 suspension fertilizer on June 4 when the plants were about 4 inches tall. The vines were beaten off October 20, and the tubers were harvested on October 25. The tubers were stored at 50-55 F from October 25 to December 12. Forty tubers per clone were cut for hollow heart and brown center. Specific gravity determinations were made between December 13-16.

Royal Slope Trial III (Table 4). Seed tubers of 36 clones and 5 named varieties were cut into two ounce seed pieces and treated with Captan on April 12-13. They were planted April 20. The plants were sidedressed

with 3,125 lbs/acre of a 12-12-12 suspension fertilizer on June 5 when the plants were about 4 inches tall. The vines were beaten off on October 29, and the tubers were harvested on October 26.

Twenty tubers of each clone were cut for hollow heart and brown center. A 35 pound sample of each clone was placed in 40 F storage on November 5 and moved to 70 F storage on January 25. They were reconditioned for 8 days. Then specific gravity and chip color determinations were made on February 2.

Royal Slope Trial IV (Table 5). Only one replication was planted and there were no paired plot comparisons. Seed tubers from 14 clones and 5 named varieties were cut into two ounce seed pieces, treated with Captan, and planted on April 20. The plants were fertilized with 2,500 lbs/acre of a 12-12-12 suspension fertilizer on June 5 when the plants were about 4 inches tall. The vines were beaten off on October 20, and the tubers were harvested on November 5. Twenty tubers of each clone were cut for brown centers and hollow heart. Samples were placed into 40 F storage on November 10 and then transferred to 70 F storage on December 10. Seven days thereafter, the tubers were tested for specific gravity and chip color.

Royal Slope Trial V (Table 6). Seed was obtained from commercial seed sources for the following selections: WC 285-18, WC 285-146 (Centennial), Kennebec, Norgold, and Russet Burbank. The seed was cut on April 20 into two ounce seed pieces and treated with Captan. They were planted April 21 into single row plots 170 feet long. Each selection was randomly duplicated. The plants were fertilized with 2,500 lbs/acre of a 12-12-12 suspension fertilizer on June 5 when the plants were about 4 inches tall. The vines were beaten off on October 20, and the tubers were harvested on November 5. Samples were weighed and then placed into 45-50 F storage. They were weighed again on February 17. Weight loss and sprout length were noted.

Sugar Analyses (Table 7). Ten selections were grown in a minimum-till field on the Othello Research Farm. The seed was cut and treated with Captan on April 9 and planted April 12. The plots were side dressed with 2,500 lbs/acre of a 12-12-12 suspension fertilizer. Tubers were harvested on October 10, and samples were placed into 50 F storage until November 11 when they were given to Dr. W.M. Iritani for storage studies. On November 11, Dr. Iritani put the samples into 42 F storage. On January 10 and on February 10 smaller samples from the large samples were analyzed for dry matter, percent reducing sugars, percent sucrose and pH.

Washington Table 1. Sencor Damage

<u>Clone</u>	<u>Degree of Damage</u>
W 420-1	Severe marginal necrosis
WC 285-146	Mild marginal necrosis
ND 6993-13	Severe marginal necrosis, almost dead
BC 7812-1	Mild marginal necrosis
B 7664-6	Mild marginal necrosis

Washington Table 2. Royal Slope Farm Variety Trial 1.^{1/}

Selection	cwt/a		% 1's		Spec. Grav. ^{2/}		% Hol. Heart	
	Clone	RB	Clone	RB	Clone	RB	Clone	RB
A 503-42	681	494	70	58	88	84	8	2
CD 138-3	670	420	74	61	96	87	3	2
Kennebec	659	442	72	53	84	82	2	0
BC 7812-1	560	513	77	61	78	84	3	0
A 63126-9	516	434	51	68	93	90	5	0
B 7024-81	500	467	71	54	105	89	0	5
B 7664-6	500	489	62	54	86	87	0	0
BR 6626-5	500	406	75	61	95	90	3	0
A 6371-2	494	429	64	62	94	83	5	5
BR 7093-24	494	417	88	50	91	82	10	0
A 69827-2	483	448	67	63	87	89	0	0
WC 284-1	477	389	67	60	77	84	0	0
BC 7679-4	472	489	72	59	78	88	20	7
A 66122-3	461	456	76	63	84	87	10	0
A 69327-5	461	470	58	55	90	89	3	2
B 6987-184	450	450	68	65	97	88	3	2
A 66107-51	439	421	45	58	81	89	1	12
BR 6864-1E	439	478	67	51	86	88	3	0
CA 60-24	439	410	76	60	76	87	0	0
A 66102-16	434	461	87	62	96	83	5	5
B 6987-57	434	368	49	68	100	90	8	0
CC 53-4	434	511	86	65	92	93	0	5
B 7589-6	423	510	78	57	98	87	0	0
A 6830-3	417	404	56	57	95	87	0	0
A 68686-22	412	513	45	56	79	87	0	5
A 69657-4	406	442	76	59	94	90	0	0
B 6987-201	406	397	83	58	103	90	0	0
WC 285-18	395	483	79	57	85	83	5	5
Hi Plains	373	459	70	57	86	93	3	2
WC 304-4	346	409	79	58	66	84	3	0
A 6135-4	340	494	61	53	78	87	3	5
CC 05-17	340	572	74	65	77	90	0	0
B 7024-60	329	532	73	53	89	86	0	10
WC 314-2	329	469	70	58	86	85	5	0
WC 345-15	324	450	75	59	86	88	-	2
WC 316-1	296	489	73	58	75	86	3	2
B 7151-4	291	434	75	65	100	83	0	0
Norgold	274	368	80	52	76	89	0	5
B 7139-4	252	387	61	60	91	89	0	7
ND 6993-13	198	437	69	53	70	90	0	0
W 420-1	176	442	39	56	72	88	3	2
W 338-1	93	417	47	59	74	84	0	0
Mean		452		59		87		2

^{1/}Planted April 14-15, Harvested September 30, Fertilized with a 2500 lbs per acre 12-12-12 suspension.

^{2/}1.0 is omitted

Washington Table 3. Royal Slope Farm Variety Trial 2.^{1/}

Selection	cwt/a		% 1's		Spec. Grav. ^{2/}		% Hol. Heart		% Br. Center	
	Clone	RB	Clone	RB	Clone	RB	Clone	RB	Clone	RB
A 6371-2	972	670	46	58	87	85	5	5	5	5
A 503-42	769	549	70	71	81	89	7	2	3	0
BR 6864-1E	758	527	79	71	75	82	0	5	0	0
Hi Plains	747	642	70	61	84	87	0	0	0	2
CD 138-3	725	593	67	66	82	82	2	2	0	2
Kennebec	686	654	69	66	84	87	0	2	0	7
CC 53-4	681	604	71	60	86	85	0	5	10	2
B 6987-184	670	574	57	58	103	78	2	2	0	5
WC 345-15	670	618	60	70	71	86	20	7	0	0
A 66107-51	637	612	45	67	67	79	5	0	10	0
A 66102-16	626	654	53	65	91	89	7	5	10	2
A 69657-4	620	648	49	61	88	82	0	2	0	5
A 69827-2	620	680	51	60	81	85	3	5	2	2
BR 6626-5	620	618	67	64	85	87	0	5	0	7
B 6987-201	609	494	69	68	95	82	2	2	5	5
B 7151-4	609	530	66	70	95	86	0	5	5	0
A 63126-9	604	522	49	63	85	83	0	5	15	5
B 7024-81	598	670	79	58	102	85	5	5	0	5
WC 285-18	598	618	60	71	78	82	0	7	0	0
A 69327-5	593	681	60	60	87	89	5	2	0	2
BC 7812-1	587	615	68	63	79	90	0	2	2	0
WC 316-1	587	692	76	71	83	81	15	7	5	0
B 7589-6	571	417	81	71	93	76	0	0	0	0
B 7664-6	571	456	68	63	87	87	2	2	0	2
B 6987-57	554	538	65	66	88	84	2	7	0	2
CA 60-24	554	615	69	61	68	83	0	0	0	2
BR 7093-24	549	570	68	72	93	89	3	2	1	2
WC 314-2	544	538	66	66	81	83	8	5	0	2
A 6830-3	527	417	59	63	86	82	0	5	0	10
A 6135-4	511	527	74	71	72	90	5	5	0	0
A 68686-22	494	604	36	62	87	87	0	2	2	5
B 7139-4	489	588	69	71	87	88	0	0	0	2
BC 7679-4	478	615	59	64	76	86	15	2	2	2
WC 284-1	478	516	78	66	74	83	0	5	0	2
WC 304-4	467	689	78	57	64	86	2	2	0	0
Centennial	439	780	80	66	83	87	5	5	5	5
WC 337-2	434	617	79	69	71	86	5	2	0	0
ND 6993-13	423	610	65	66	77	83	0	5	0	0
A 66122-3	384	689	71	68	70	85	0	2	0	0
Norgold	384	681	69	61	73	89	0	5	0	5
CC 05-17	373	577	70	61	78	90	2	2	0	2
W 420-1	313	780	47	69	78	84	0	5	0	0
W 338-1	231	604	68	66	77	86	0	0	0	5
Mean		602		65		85		3		2

Washington Table 3, continued.

1/Planted April 19, harvested October 25, fertilized with a 2708 lbs/acre
12-12-12 suspension.

2/1.0 omitted.

Washington Table 4. Royal Slope Farm Variety Trial 3. ^{1/}

Selection	cwt/a	% 1's		Spec. Grav. ^{1/}		% Hol. Heart	Clone Chip Color		Clone Description ^{2/}
		Clone	RB	Clone	RB		Color	Unifor-mity	
A 503-42	1082	555	68	87	85	0	5.0	1	R, W
A 69327-5	774	763	65	84	85	4	6.5	2	L, R
B 7151-4	774	571	71	101	85	4	4.5	1	Ob, W
Centennial	736	642	64	76	84	0	7.0	2	L, R
Hi Plains	714	538	67	80	84	0	6.0	1.3	L, R
WC 345-15	692	820	65	82	87	0	6.5	1.5	L, R
B 7589-6	659	851	60	90	87	0	6.5	1	Ob, W
BC 7812-1	648	552	61	72	84	0	7.0	1	L, R
BR 7093-24	642	747	65	91	87	5	6.3	1.5	L, R
A 6830-3	637	516	71	90	84	4	6.0	1	L, R
B 6987-201	637	519	63	96	85	0	5.5	1	Rd, W
WC 304-4	626	783	68	68	88	0	7.3	1.5	L, R
WC 316-1	626	642	67	70	86	25	8.0	2	L, R
BR 6626-5	620	722	69	85	84	0	7.5	2	Ob, W
A 6371-2	609	599	62	89	84	0	6.8	2	L, R
Norgold	604	609	70	76	81	0	7.0	2	L, R
A 66102-16	598	662	67	88	84	0	7.0	2	Ob, R
WC 285-18	598	679	67	75	82	4	---	-	L, R
WC 314-2	598	571	68	83	84	20	---	-	Ob, R
A 69657-4	593	950	65	76	86	0	6.5	2	Ob, W
B 7024-81	582	689	65	102	87	0	4.5	1	L, Ob, W
B 7664-6	582	826	69	83	84	0	6.8	1.5	Ob, W
W 338-1	582	869	64	77	87	0	7.7	1.5	L, R
Kennebec	582	809	66	78	85	0	5.5	1.5	Ob, W
ND 6993-13	576	756	74	71	85	0	7.0	3	L, R
A 68686-22	571	694	69	81	80	0	6.0	2.5	L, R
A 69827-2	571	688	69	76	88	10	8.0	2	L, Red
CC 05-17	571	858	67	73	81	10	7.0	1	Rd, W
CC 53-4	554	579	66	86	84	0	8.0	1.5	Ob, W
WC 337-2	549	747	68	75	80	0	7.0	1.3	Ob, W
B 6987-57	544	730	65	88	86	0	6.5	3	Ob, W

Washington Table 4, continued.

Selection	cwt/a		% 1's		Spec. Grav. ^{1/}		% Hol. Heart		Clone Color		Clone Description ^{2/}
	Clone	RB	Clone	RB	Clone	RB	Clone	RB	Color	Uniformity	
A 66122-3	527	532	55	71	72	86	0	2	6.5	2	L, R
CD 138-3	516	634	74	64	86	86	0	0	7.5	1.7	Ob, W
BC 7679-4	505	643	70	67	72	80	20	0	7.0	2	L, R
BR 6864-1E	494	679	66	60	75	85	0	2	6.8	2.5	Ob, W
CA 60-24	483	859	66	67	73	84	0	2	7.4	2.5	Ob, W
B 7139-4	450	643	68	66	88	87	4	0	5.8	1	5% rot
A 63126-9	406	555	62	71	90	85	3	0	7.0	2	L, R
A 6135-4	379	672	61	68	70	87	0	0	8.0	1	L, W, B
WC 284-1	323	637	57	68	78	84	0	2	8.0	1	L, R
Mean		685		66		85		2	6.0	2	

^{1/}Planted April 20, Harvested October 26, Fertilized with a 3,125 lbs/acre 12-12-12 suspension.

^{2/}1.0 omitted.

^{3/}R = Russet, W = White, B = Buff, L = Long, Ob = Oblong, Rd = Round.

Washington Table 5. Royal Slope Farm Variety Trial 4.^{1/}

<u>Selection</u>	<u>cwt/a</u>	<u>% 1's</u>	<u>Spec. Grav.</u> ^{2/}	<u>% Hol. Heart</u>	<u>Chip Color</u>	<u>Description</u> ^{3/}
A 68113-4	922	52	77	0	6.5	L - Ob, W
A 67142-1	873	60	70	0	6.5	L - Ob, W
WC 285-18	834	66	83	0	8.0	L, R
ATD 27-1	774	60	72	6	5.0	L, R
Snowchip	741	74	87	0	4.0	Ob, W
Kennebec	730	70	72	0	6.5	Ob, W
A 69827-4	725	55	76	0	6.5	Rd, R
A 69850-4	721	47	67	0	6.0	L, R
A 69657-4	714	60	82	0	5.0	L - Ob, R
A 63126-9	705	49	74	0	8.0	L, R
R. Burbank	704	58	80	3	6.0	L, R
A 5400-15	697	56	81	0	4.0	L, B
AK-25	692	54	71	10	6.0	Rd - Ob, W
AK 37-19	664	68	102	0	4.0	Ob, W
AK 28	629	69	79	0	6.0	Ob, W
NDA 8856-11	340	74	70	0	---	L, R
Norgold	339	70	70	0	7.0	L, R
Centennial	293	65	67	0	8.0	L, R
W 338-1	231	78	69	0	6.0	L, R

^{1/}One replication, Planted April 20, Harvested November 5, Fertilized with a 2,500 lbs/acre 12-12-12 suspension.

^{2/}1.0 is omitted.

^{3/}R = Russet, W = White, B = Buff, L = Long, Ob = Oblong, Rd = Round

Washington Table 6. Large Plot Royal Slope Trials^{1/}

Selection	Acres	cwt	% Under 2 Inches	% 1's	Sample Size - lbs.	% Storage Loss	Sprout Length In Inches
WC 285-18	.074	529	7.8	68	225	12	1 2/3 - 2 1/3
Centennial	.037	382	11.4	69	450	12	0 - 1/3
Kennebec	.049	817	2.5	74	600	5	0 - 1/3
Norgold	.049	435	9.6	74	460	10	1 - 2
Russet Burbank	.049	560	6.5	63	675	5	0 - 1/16

^{1/}Planted April 21, Harvested November 6, Fertilized with a 2500 lb/a 12-12-12 suspension.

Washington Table 7. Post-storage sugar analyses of some promising clones.^{1/}

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Variety	cwt/a	% 1's	Date	% Dry Matter		% Reducing		% Sucrose		% Fructose		pH	
				Stem	Bud	Stem	Bud	Stem	Bud	Stem	Bud	Stem	Bud
A 503-42	545	71	1-10-77	24.4	20.0	4.4	5.6	1.3	1.9	2.1	2.2	6.30	6.05
			2-21-77	22.2	18.2	4.7	6.2	1.8	1.1	2.1	2.8	6.40	6.10
			Average	23.3	19.1	4.5	5.9	1.5	1.0	2.1	2.5	6.35	6.08
A 69327-5	537	60	1-10-77	19.2	18.4	3.9	4.1	0	0.5	0	2.1	6.05	6.05
			2-21-77	18.8	18.0	4.9	4.0	1.2	1.2	1.8	1.9	6.15	6.10
			Average	19.0	18.2	4.4	4.0	0.6	0.9	0.9	2.0	6.10	6.08
A 66122-3	499	56	1-10-77	19.8	18.0	2.8	2.6	0.7	1.1	1.4	1.0	6.05	6.00
			2-21-77	19.2	17.8	3.5	2.8	0.9	1.0	2.7	1.1	6.10	6.00
			Average	19.5	17.9	3.2	2.7	0.8	1.1	2.1	1.1	6.08	6.00
B 69887-201	456	57	1-10-77	22.2	19.8	3.6	2.9	1.1	1.5	1.7	1.4	6.15	6.05
			2-21-77	24.6	22.2	2.9	2.3	1.6	1.4	1.0	1.2	6.25	6.20
			Average	23.4	21.0	3.3	2.6	1.4	1.5	1.4	1.3	6.20	6.13
A 66102-16	410	54	1-10-77	21.0	18.8	3.5	2.7	1.1	1.3	1.6	1.4	6.10	6.00
			2-21-77	21.4	18.6	3.0	3.4	1.4	1.6	1.5	1.3	6.20	6.05
			Average	21.2	18.7	3.3	3.1	1.3	1.4	1.6	1.4	6.15	6.03
A 6371-2	373	56	1-10-77	20.8	19.6	5.7	4.9	1.1	0.5	2.8	2.6	6.05	6.00
			2-21-77	20.0	18.8	5.2	3.7	1.2	1.8	2.6	1.8	6.10	6.05
			Average	20.4	19.2	5.4	4.3	1.1	1.2	2.7	2.2	6.08	6.03
Russet Burbank	333	63	1-10-77	22.0	21.2	3.7	2.4	1.1	0.8	2.1	1.3	6.05	5.95
			2-21-77	19.6	19.2	4.4	2.8	1.5	1.2	1.9	1.2	6.00	5.95
			Average	20.3	20.2	4.1	2.6	1.3	1.0	2.0	1.3	6.03	5.95
A 6135-4	298	55	1-10-77	18.6	18.2	7.4	6.0	0.9	1.3	4.0	3.1	6.10	6.10
			2-21-77	18.8	18.6	8.0	5.6	2.4	1.3	3.2	2.5	6.15	6.15
			Average	18.7	18.4	7.7	5.8	1.7	1.3	3.6	2.8	6.13	6.13
B 7024-81	279	72	1-10-77	23.0	20.4	3.6	3.0	1.2	1.7	1.6	1.1	6.15	6.10
			2-21-77	22.8	19.2	2.8	2.4	1.1	1.4	1.4	0.9	6.20	6.15
			Average	22.9	19.8	3.2	2.7	1.2	1.5	1.5	1.0	6.18	6.13

Washington Table 7, continued.

<u>Variety</u>	<u>cwt/a</u>	<u>% 1's</u>	<u>Date</u>	<u>% Dry Matter</u>		<u>% Reducing</u>		<u>% Sucrose</u>		<u>% Fructose</u>		<u>pH</u>	
				<u>Stem</u>	<u>Bud</u>	<u>Stem</u>	<u>Bud</u>	<u>Stem</u>	<u>Bud</u>	<u>Stem</u>	<u>Bud</u>	<u>Stem</u>	<u>Bud</u>
Centennial	157	54	1-10-77	18.6	18.8	5.9	4.4	2.2	0.2	2.4	2.6	6.00	5.90
			2-21-77	17.6	17.6	6.0	4.2	1.8	1.7	2.7	1.8	6.00	5.95
			Average	18.1	18.2	6.0	4.3	2.0	1.0	2.5	2.2	6.00	5.93

1/Planted April 12, Harvested October 10, Fertilized with a 2500 lbs/a 12-12-12 suspension.

WEST VIRGINIA

R. J. Young^{1/} S. K. Bhatia^{1/} S. I. Pensis^{1/} and F. J. Alt^{1/}

Potato Evaluation Trials

Potato Variety Trials 1976. The 1976 potato variety evaluation trial was conducted on the West Virginia Agriculture Experiment Station Farm (W.Va. AES) at Reedsville, West Virginia.

Thirty entries were arranged in a randomized blocks design with six replications. All selections were round-to oblong white skinned types. Seed for 15 selections was provided by the MAES Sangerville Seed Farm (Tables 1, 3 & 5), and seed for 15 selections (Tables 2, 4 & 6) from the W.Va. AES seed plot located in the Canaan Valley near Davis, West Virginia.

The trial was hand planted into preformed rows on May 10, 1976. Within row spacing was approximately 10 inches while row spacing was about 38 inches. One half the fertilizer was broadcast and plow down, while the remainder was applied in the ferrow at planting. Temik was also applied at planting at a rate of 20 pounds of product per acre. To control late blight, potato vines were sprayed on a weekly schedule beginning July 15 with three pounds of Manzate 200. Protective sprays could not be applied for the period August 23 through September 1, because of frequently heavy precipitation. Foliage was killed on September 8 and all tubers harvested on October 14, 1976.

In this test, only five selections yielded 250 CWT/A or more, (Table 1).

* Seedling B7163-14 produced a marketable yield of 309 CWT/A compared to Kennebec which produced 318 CWT/A. Specific gravity and total solids for B7163-14 were poor, but it exhibited a moderate level of tolerance to late blight when given supplemental protection with fungicides. Seedling B6987-29 had the highest specific gravity and total solids but appearance ratings and yields were poor. In previous trials at other locations, Atlantic has produced yields superior to Katahdin, but in the 76 W.Va. trials, Atlantic produced yields inferior to Katahdin. Specific gravity and total solids were slightly better than Katahdin. Only two selections, Atlantic and seedling B6986-26 gave satisfactory chip color. Monona, Penn 71, B6987-1, and B6987-29 gave marginal chip color when grown under W.Va. conditions (Table 5).

In this test, (Table 2) of the 15 W.Va. selections, 10 produced yields greater than 250 CWT/A. Seedlings BR5991-WV16 and B6043-WV6 continue to produce excellent yields with acceptable specific gravities and total solids. None of the W.Va. selections produced acceptable chip color.

^{1/} Associate Plant Pathologist, Graduate Assistants, and Farm Manager respectively, West Virginia Agriculture Experiment Station.

Most of the entries in this test were selected under W.Va. conditions and appear to be well adapted to our growing conditions, hence the higher yields. They have also been selected for their resistance to late blight (Table 2) which is reflected in a lower defoliation. Two consecutive weekly sprays were missed the latter part of August because of heavy precipitation. These selections sustained less foliar damage during this period because they carry a moderate level of multigenic resistance to late blight. The inherent resistance partially protected them when fungicides could not be applied.

Multigenic Resistance to Potato Late Blight

Late Blight Trials 1976. The Huttonsville late blight trial was machine planted on June 3, 1976. In most cases, either 10 or 20 hills of each test clone were planted as a single replication. Fertilizer and systemic insecticides were incorporated at planting. Boarder rows and every third row throughout the plot were planted with the variety Penchip which carries the R-3 gene and a moderate level of multigenic resistance to potato late blight. On the evening of July 22, the source rows (Penchip) were inoculated with race - 1, 2, 3, 4 (Isolate H127) of Phytophthora infestans. Environmental conditions were nearly optimal for the inoculation. Typical late blight lesions were evident six days later on July 28. Foliage evaluations were made on August 10, and weekly thereafter through September 16. Results of this trial are found in the accompanying table, (Table 7).

Acknowledgement - Special thanks are offered to Hugh Murphy and MAES people for providing the specific gravity and total solids data and the statistic analysis.

West Virginia Table 1. Yield, percentage of yield between 1-7/8 and 4 inches, specific gravity, total solids, and late blight ratings for 15 potato varieties grown at Reedsville, West Virginia - 1976.

Variety ¹	Yield above 1-1/2 inches Cwt/A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/2 to 4 inches	Specific Gravity ³	Percentage total solids ⁴	Late Blight Ratings ²
Atlantic	245	97.9	68.0	1.080	20.21	3.3
Katahdin	261	94.6	79.5	1.072	18.53	3.5
Kennebec	318	63.7	57.3	1.076	19.37	2.2
Monona	208	95.8	80.6	1.061	16.21	3.5
Norchip	247	96.3	76.6	1.077	19.58	3.7
Penn 71	250	89.7	76.7	1.073	18.74	3.5
Superior	282	95.1	79.4	1.062	16.42	4.3
AF41-2	144	98.5	63.8	1.073	18.74	3.3
B6139-11	245	94.0	80.8	1.083	20.85	2.8
B6529-12	208	80.8	68.0	1.065	17.05	2.8
B6986-26	185	93.8	75.2	1.079	20.00	3.3
B6987-1	227	90.5	77.8	1.074	18.95	3.8
B6987-29	212	100.0	78.2	1.086	21.48	2.8
B7033-33	173	96.1	82.5	1.080	20.21	3.7
B7163-14	309	93.8	83.9	1.059	15.78	2.5
Bayes L.S.D. (0.05)	51			0.007		

1/ Planted - May 10; killed - September 8; harvested - October 14, 1976.

Seedpiece spacing: All varieties space 10 inches apart.

Fertilization: 60-60-60 broadcast plus 60-60-60 banded in rows.

2/ Rating scale: 1 = none; 5 = completely dead.

3/ Specific gravity determined by air and water method.

4/ Total solids were calculated by the use of Von Scheele's regression equation.

West Virginia Table 2. Yield, percentage of yield between 1-7/8 and 4 inches, specific gravity, total solids, and late blight ratings for 15 potato varieties grown at Reedsville, West Virginia - 1976.

Variety ¹	Yield above 1-1/2 inches Cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/2 to 4 inches	Specific Gravity ³	Percentage total solids ⁴	Late Blight ² Ratings
CA03-2	110	100.0	75.2	1.061	16.21	4.5
CA25-3	208	97.3	70.2	1.074	18.95	3.7
CA46-11	145	97.4	80.8	1.070	18.10	3.3
BR5991-WV13	321.9	93.5	83.2	1.092	22.75	2.5
B6086-WV21	343.1	78.0	67.5	1.072	18.53	1.5
B6043-WV6	398.3	83.7	72.6	1.082	20.64	1.5
B6935-WV	203.3	86.2	72.3	1.068	17.68	3.3
B6949-WV6	380.6	84.7	73.6	1.073	18.74	3.0
B6949-WV3	252.2	72.4	67.8	1.070	18.10	2.0
B6139-11	248.7	89.2	76.1	1.084	21.06	3.0
B6782-1	284.3	92.8	78.1	1.063	16.63	3.5
B6928-WV14	312.2	95.7	81.4	1.080	20.21	2.5
BR5991-WV16	455.3	87.6	79.2	1.087	21.69	2.5
B3682-WV1	298.1	76.7	67.1	1.084	21.06	2.2
Kennebec	261.8	70.3	65.5	1.079	20.00	2.3
Bayes L.S.D. (0.05)	51.			0.007		

1/ Planted - May 10; killed - September 8; harvested - October 14, 1976.

Seedpiece spacing: All varieties spaced 10 inches apart.

Fertilization: 60-60-60 broadcast plus 60-60-60 banded in rows.

2/ Rating scale: 1 = none, 5 = completely dead.

3/ Specific gravity determined by air and water method.

4/ Total solids were calculated by the use of Von Scheele's regression equation.

West Virginia Table 3. Percent of total yield distribution by grade size classes, sunburned tubers, and grade defects for 15 potato varieties grown at Reedsville, West Virginia - 1976.

Variety	Under 1-1/2 inches	1-7/8 to 2-1/2 inches	2-1/2 to 4 inches	Over 4 inches	% sunburned tubers	% grade defects ¹
Atlantic	5.1	29.9	68.0	2.1	0.5	1.6
Katahdin	2.7	15.1	79.5	5.4	1.2	0.0
Kennebec	4.2	6.4	57.3	36.3	10.9	12.2
Monona	3.7	15.2	80.6	4.1	1.8	1.4
Norchip	4.1	19.7	76.6	3.7	1.2	4.0
Penn 71	3.4	13.0	76.7	10.3	2.8	5.4
Superior	3.4	15.7	79.4	4.9	1.1	2.0
AF41-2	6.5	34.7	63.8	1.4	0.7	2.1
B6139-11	5.2	13.2	80.8	6.1	4.4	5.6
B6529-12	2.2	12.8	68.0	19.2	1.5	7.8
B6986-26	2.2	18.6	75.2	6.2	0.5	0.9
B6987-1	3.5	12.8	77.8	9.3	1.2	1.6
B6987-29	3.7	21.8	78.2	0.0	0.9	3.3
B7033-33	3.8	13.6	82.5	3.9	3.1	4.8
B7163-14	3.6	9.9	83.9	6.2	2.4	6.1

^{1/} Includes tubers with knobs and growth cracks.

West Virginia Table 4. Percent of total yield distribution by grade size classes, sunburned tubers, and grade defects for 15 potato varieties grown at Reedsville, West Virginia - 1976.

Variety	Under 1-1/2 inches	1-7/8 to 2-1/2 inches	2-1/2 to 4 inches	Over 4 inches	% sunburned tubers	% grade defects ¹
CA03-2	4.0	24.8	75.2	0.0	0.3	2.1
CA25-3	4.6	27.1	70.2	2.7	0.2	2.7
CA46-11	3.9	16.6	80.8	2.6	0.7	4.7
BR5991-WV13	6.3	10.3	83.2	6.4	1.9	2.9
B6086-WV21	5.6	10.5	67.5	22.0	12.0	8.9
B6043-WV6	4.2	11.1	72.6	16.2	3.7	5.2
B6935-WV2	3.6	13.9	72.3	13.9	7.6	2.3
B6949-WV6	3.2	11.1	73.6	15.2	3.0	1.6
B6949-WV3	1.9	4.6	67.8	27.6	5.1	5.6
B6139-11	3.5	13.1	76.1	10.7	3.8	2.9
B6782-1	3.8	14.7	78.1	7.2	2.1	3.1
B6928-WV14	4.1	14.3	81.4	4.2	0.72	2.1
BR5991-WV16	4.2	8.4	79.2	12.4	2.4	5.8
B3682-WV1	2.3	9.6	67.1	23.3	0.17	6.8
Kennebec	2.8	4.8	65.5	29.6	10.8	12.8

^{1/} Includes tubers with knobs and growth cracks.

West Virginia Table 5. Chip color and indices for 15 potato varieties grown at Reedsville, West Virginia - 1976.

Variety	Chip Color ¹
Atlantic	7.1
Katahdin	8.6
Kennebec	9.0
Monona	7.7
Norchip	8.3
Penn 71	7.6
Superior	8.5
AF41-2	9.6
B6139-11	8.2
B6529-12	8.6
B6986-26	7.2
B6987-1	7.9
B6987-29	7.4
B7033-33	8.0
B7163-14	8.3
Bayes L.S.D. (0.05)	0.6

¹/ Chips with lower indices are lighter in color as determined by comparison with PC11 Reference Color Chart 1206-U.

West Virginia Table 6. Chip color and indices for 15 potato varieties grown at Reedsville, West Virginia - 1976.

Variety	Chip Color ¹
CA03-2	9.2
CA25-3	9.2
CA46-11	7.6
BR5991-WV13	8.3
B6086-WV21	10.0
B6043-WV6	9.8
B6935-WV2	9.0
B6949-WV6	9.6
B6949-WV3	8.8
B6139-11	7.8
B6782-1	9.9
B6928-WV14	9.8
BR5991-WV16	9.1
B3682-WV1	9.1
Kennebec	8.3
Bayes L.S.D. (0.05)	0.6

¹/ Chips with lower indices are lighter in color as determined by comparison with PC11 Reference Color Chart 1206-U.

West Virginia Table 7. Evaluation of 83 clonal selections for multigenic resistance to Potato Late Blight, Huttonsville, West Virginia - 1976.

1976		Foliage Evaluations <u>1/</u>				
Field No.	Pedigrees	Aug 10	Aug 18	Aug 25	Sept 10	Sept 16
<u>West Virginia Lines</u>						
301	B6028-WV 6	0	1-	1+	3	2
302	B6981-WV 2	0	1+	3+	5	5
303	B6655-WV 1	0	1+	2	3+	3+
304	B6928-WV 14	0	1-	3-	3+-4-	3+
305	B6935-WV 2	0	1+	2	3+-4-	4
306	B6043-WV 6	0	1-	2-	2	2+
307	B6949-WV 3	0	1-	1	1+	1+
308	B6086-WV21	0	1-	2+	3+-4-	4
309	B6026-WV 5	0	1-	1	1+-2-	2
310	B5264-WV 6	0	2	3	4	5-
311	BR5991-WV 16	0	0	2+	3+-4-	4
312	Kennebec	0	3-	4	5-	5
313	B5141-6 (Lenape)	0	3+	4+	5	5
314	BR5991-WV 13	0	1+	2+	4+	5-
315	B5662-WV 13	0	2-	3-	4+	4+
316	B5662-WV 4	0	0	1-	2+	2+
317	Sebago	0	3+	4	5-	4+
318	Katahdin	0	3+	4+	5-	5
319	B6960-WV 2	0	1	1+	2-	2+
320	B6960-WV 4	0	0	1	2-	1-
321	B7153-14	0	3+	4	5	5
322	Benchip	0	2-	2+	3+-4-	4
323	B6988-WV 5	0	1+	2+	4+	5
224	B6988-WV 15	0	0	1	2-	1+
<u>Sangerville Lines</u>						
325	B7163-14	0	2+	3+	4+	5
326	Norchip	0	3+	5	5	5
327	B6987-1	0	3	5-	5	5
328	Penn-71	0	2+	3+	5	5
329	B6987-56	0	3	4+	5	5
330	B6939-11	0	2	3+	5	5
331	Monona	0	3+	4+	5	5
332	B7033-33	0	3+	4	5	5
333	Katahdin	0	3-	4	5	5
334	B6987-29	0	3+	4+	5	5
335	B6529-12	0	3+	4	5	5
336	B6986-26	0	3	4+	5	5
337	AF41-2	0	3+	4+	5	5
338	Superior	0	3+	4+	5	5
339	Kennebec	0	3	4	5	5
<u>Campbell Soups Lines</u>						
340	BR6626-5 (1363)	0	3	4-	5	5
341	BR6820-26 (1364)	0	3+	4	5	5
342	Vert. (1365)	0	3	4	5	5
343	BR6863-3 (1366)	0	3+	4+	5	5
344	BR7085-1 (1367)	0	3	4+	5	5
345	BR7104-10 (1370)	0	3+	5-	5	5
346	B6987-184 (1373)	0	3+	4+	5	5
347	CA02-7 (1374)	0	3	4	5-	5
348	CA11-13 (1376)	0	4+	5-	5	5
349	CA55-24 (1383)	0	3	4+	5	5

1976		Foliage Evaluations ^{1/}				
Field No.	Pedigrees	Aug 10	Aug 18	Aug 25	Sept 10	Sept 16
350	CA63-1 (1386)	0	3+	4+	5	5
351	CC05-15 (1388)	0	3+	4+	5	5
352	CC05-17 (139)	0	3+	4	5	5
353	CC06-5 (1392)	0	3	4	5	5
354	CC06-12 (1393)	0	3+	4	5	5
355	CC08-3 (1394)	0	3+	4+	5	5
356	CC14-1 (1395)	0	3+	4	5	5
357	CC54-8 (1397)	0	3+	4+	5	5
358	CD03-4 (1400)	0	3	4-	5	5
359	CD08-21 (1404)	0	3	4	5	5
360	CD12-18 (1406)	0	3+	4+	5	5
361	CD23-1 (1407)	0	3+	5-	5	5
362	CD34-2 (1409)	0	3+	4	5	5
363	CD47-32 (1412)	0	3	4	5	5
364	CD51-4 (1415)	0	3+	4	5	5
365	CD70-22 (1419)	0	3+	4+	5	5
366	CD85-5 (1427)	0	3	4	5	5
367	CD85-11 (1428)	0	3	4	5	5
368	CD106-16 (1432)	0	3	4	5	5
369	CD111-9 (1433)	0	3+	4	5	5
370	CD124-1R (1435)	0	3	4+	5	5
371	CD130-7R (1436)	0	3	4	5	5
372	CD137-54 (1438)	0	3	4+	5	5
373	CD138-4R (1441)	0	3+	5-	5	5
374	CD139-9 (1443)	0	3	4+	5	5
375	AF22-8c (1508)	0	3	4+	5	5
376	AF24-33c (1510)	0	3	4+	5	5
377	AF25-18c (1511)	0	3+	4	5	5
378	AF40-9c (1512)	0	3	4+	5	5
379	AF197-2c (1514)	0	3+	4+	5	5
380	AF201-10c (1518)	0	4-	5-	5	5
381	L-521-7	0	1+	2+	3+-4	4+
382	Atzimba	0	0	1+	2-	2

^{1/} Foliage Evaluation Scale: 0 = No late blight; 1 = trace; 2 = less than 10% defoliation; 3 = 50% defoliation; 4 = 75% defoliation; 5 = plants dead from late blight.

WYOMING

K. E. Bohnenblust

Potato Varietal and Seedling Evaluation

Locations. Nurseries designed to evaluate varieties and lines of potatoes in Wyoming were planted at the Agricultural Substation at Torrington, the "High Plains Grassland Research Station" operated by USDA-ARS near Cheyenne, and the Agricultural Substation at Powell.

Torrington. The variety trial at Torrington was planted in a field which received barryard manure and then alfalfa was plowed under. Plants were spaced 12 inches apart within rows 25 feet long, with 36 inches between rows. Furrow irrigation was used. Red LaSoda yielded best (Table 1) at 370.5 hundred weight with W 701 and Wyred not significantly different. WC 230-14 had the highest percent U.S. No. 1 potatoes. The entry, WC 316-1, exceeded all others in specific gravity and chip color.

A seedling nursery (Table 2) was also grown at Torrington. The test conditions were similar to the variety trial. Red LaSoda gave the highest yield and the only experimental line that did not yield significantly less was W 74-4. Red LaSoda also had the highest percent No. 1 potatoes. The highest specific gravity was shared by W 74-7 and W 74-2. The best chip color was the "4" of W 72-2 and W 72-12.

Cheyenne. The nursery at Cheyenne received about 100 pounds of 18-30-0 fertilizer when the potatoes were planted. Water was applied by furrow irrigation. Plants were 12 inches apart in rows 25 feet long. The rows were 40 inches apart. There were four replications. Wyred was the highest yielding clone. NDA 8451-3, A66122-3, Red LaSoda, W 701 and A6680 were not significantly different than Wyred. The highest percent No. 1 was the 89% of W 701. Nampa had the highest specific gravity, 1.101. The "3" of Russet Burbank indicated the best chipping color.

Powell. The nursery at Powell was planted on ground that had produced barley the year previous and received 100 pounds per acre of N before planting. Water was supplied by furrow irrigation. Rows were 25 feet long with plants spaced at 12 inches within rows. Rows were 36 inches apart. There were four replications. Wyred yielded the high of 358 hundred weight per acre, which was not significantly different than the yields of Red LaSoda, W 701, Russet Burbank and A6680. Wyred had the highest proportion of No. 1 potatoes at 88.5%. Both Russet Burbank and A6680 had a high specific gravity of 1.092. Three clones, Russet Burbank, NDA-8451-3 and Nampa, had the best chipping color, which was "3".

Wyoming Table 1. Yield, specific gravity and chip color of potato varieties and lines grown at Torrington, Wyoming -- 1976.

Variety	Total yield per acre	% No. 1	Specific gravity <u>1</u> /	Chip Color <u>2</u> /
Red LaSoda	370.5	81.0	1.070	5
W701	362.5	86.5	1.077	6
Wyred	353.0	88.5	1.064	7
A66122-3	326.0	70.5	1.084	6
A6680	324.0	77.0	1.078	5
Russet Burbank	320.5	69.0	1.084	6
NDA 8451-3	298.5	79.5	1.069	7
A6371-2	288.0	80.0	1.085	7
WC 230-14	232.5	90.0	1.078	8
WC 316-1	218.0	85.5	1.086	4
Centennial Russet	215.0	85.0	1.085	8
WC 285-18	146.5	78.5	1.085	6
Overall Mean	287.5			
LSD (.05)	44.5			

1/ Determined with potato hydrometer

2/ Compared with PCII color standard

Wyoming Table 2. Yield, specific gravity, and chip color of potato varieties and lines grown at Torrington, Wyoming -- 1976.

Variety	Total yield per acre	% No. 1	Specific gravity <u>1</u> /	Chip Color <u>2</u> /
Red LaSoda	290.5	86.0	1.075	8
W 701	288.0	80.0	1.076	5
Russet Burbank	281.0	65.0	1.085	5
W 74-5	276.5	81.0	1.083	6
W 74-1	228.5	80.0	1.083	8
W 74-2	216.5	81.5	1.079	4
W 74-7	182.5	63.5	1.087	6
W 74-12	173.0	71.5	1.087	4
Overall Mean	242.0			
LSD (.05)	44.5			

1/ Determined with potato hydrometer

2/ Compared with PCII color standard

Wyoming Table 3. Yield, specific gravity, and chip color of potato varieties and lines grown at Cheyenne, Wyoming -- 1976.

Variety	Total yield per acre	% No. 1	Specific gravity <u>1</u> /	Chip Color <u>2</u> /
Wyred	240.5	88.0	1.085	7
NDA 8451-3	238.0	83.0	1.079	4
A66122-3	231.5	79.0	1.089	5
Red LaSoda	226.0	86.0	1.089	4
W 701	226.0	89.0	1.093	4
A6680	210.5	82.0	1.092	4
Russet Burbank	202.5	70.0	1.097	3
A6371-2	191.0	80.0	1.094	6
Nampa	178.5	69.5	1.101	4
WC 230-14	162.0	77.0	1.090	6
WC 285-18	117.5	66.0	1.096	6
Centennial Russet	113.5	66.5	1.095	7
Overall Mean	193.5			
LSD (.05)	34.0			

1/ Determined with potato hydrometer

2/ Compared with PCII color standard

Wyoming Table 4. Yield, specific gravity, and chip color of potato varieties and lines at Powell, Wyoming -- 1976.

Variety	Total yield per acre	% No. 1	Specific gravity <u>1</u> /	Chip Color <u>2</u> /
Wyred	358.0	88.5	1.076	7
Red LaSoda	357.0	88.0	1.087	4
W 701	336.5	74.0	1.090	4
Russet Burbank	321.5	77.5	1.096	3
A6680	307.5	77.0	1.092	4
A6371-2	302.5	78.5	1.097	5
NDA 8451-3	293.0	78.5	1.084	3
Nampa	288.0	75.0	1.097	3
A66122-3	273.5	57.5	1.086	5
WC 230-14	242.0	81.0	1.092	6
WC 285-18	213.0	84.0	1.091	5
Centennial Russet	150.0	82.5	1.090	6
Overall Mean	287.0			
LSD (.05)	53.5			

1/ Determined with potato hydrometer

2/ Compared with PCII color standard

